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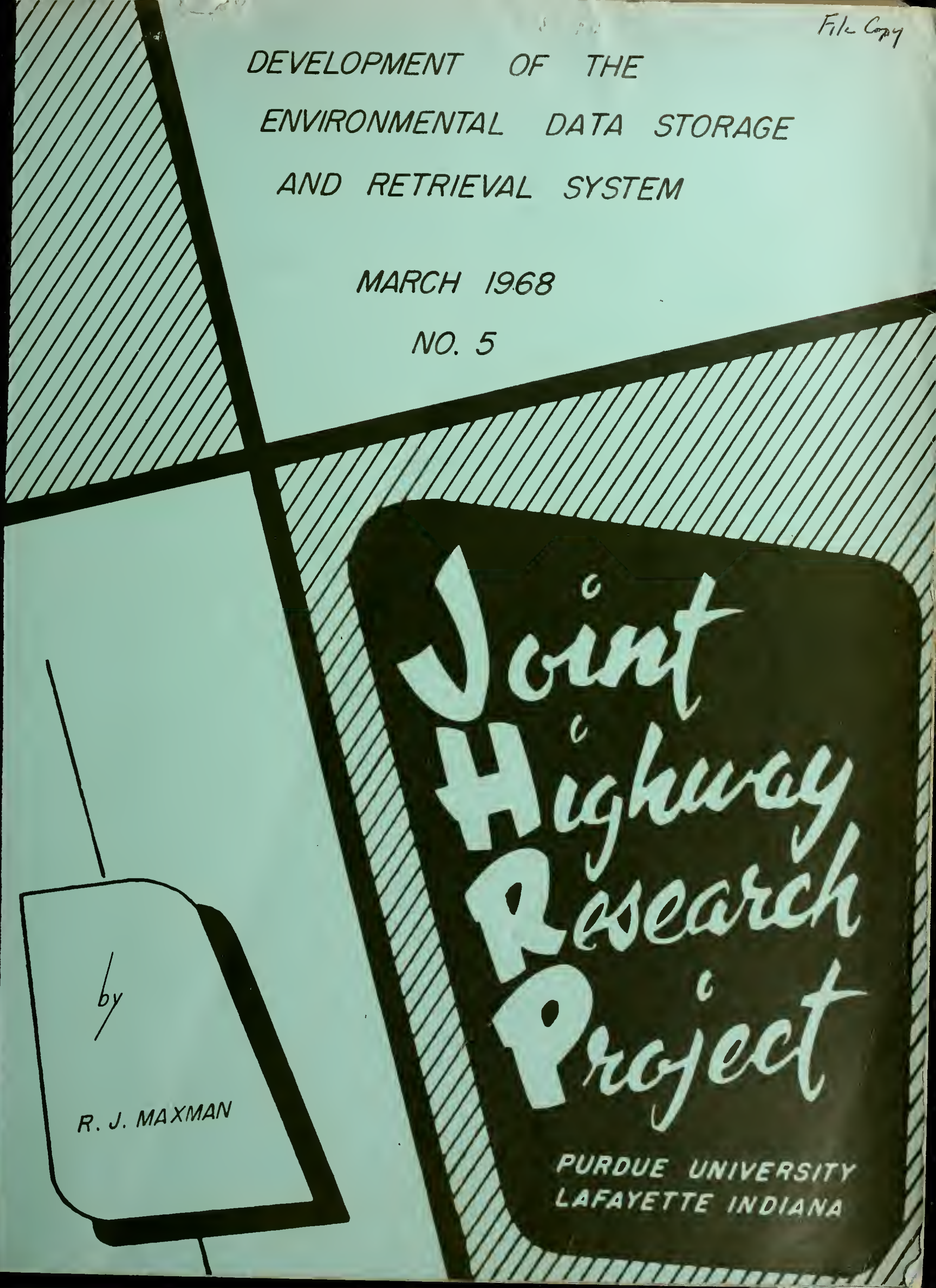

DEVELOPMENT OF THE ENVIRONMENTAL DATA STORAGE AND RETRIEVAL SYSTEM

MARCH 1968

NO. 5

by

R. J. MAXMAN

Joint
Highway
Research
Project

PURDUE UNIVERSITY
LAFAYETTE INDIANA

Informational Report

DEVELOPMENT OF THE ENVIRONMENTAL DATA STORAGE AND RETRIEVAL SYSTEM

TO: G. A. Leonards, Director
Joint Highway Research Project

May 9, 1968

File No: 3-7

FROM: H. L. Michael Associate Director
Joint Highway Research Project

The attached research report is presented to the Advisory Board for information. The report, "Development of the Environmental Data Storage and Retrieval System" was authored by Mr. Robert J. Maxman, a Graduate Trainee in the Environmental Health Institute of Purdue University. Mr. Maxman also used the research for his MSCE thesis research at Purdue and performed it under the direction of Professor W. L. Grecco.

The research reported herein was not conducted by the Joint Highway Research Project but by the Environmental Health Institute of Purdue University with funds from the Public Health Service. It is reported to the Board because of its strong relationship to urban transportation planning. The results have direct application in the continuing transportation planning process required for all metropolitan areas in Indiana of more than 50,000 population.

The report is presented to the Board as information.

Respectfully submitted,

Harold L Michael

Harold L. Michael
Associate Director

HLM:sb

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Informational Report

DEVELOPMENT OF THE ENVIRONMENTAL DATA STORAGE AND RETRIEVAL SYSTEM

by

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This Copy Provided by
Joint Highway Research Project
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Purdue University
Lafayette, Indiana
May 9, 1968

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ABSTRACT

Maxman, Robert James. MSCE, Purdue University, June 1968. Development of the Environmental Data Storage and Retrieval System. Major Professor: W. L. Grecco.

The wealth of data collected on the urban area by a multiplicity of people for a multiplicity of purposes has led to an inefficient, disorganized utilization of resources for data handling. Until recently, most of the information collected has been gathered by a specific group for a specific purpose. This information was not useable by other than the primary data recipient because of its narrow definitions and specific characteristics.

This project provides a system whereby data that is collected only once is useable by all segments of the urban environment. Universally compatible definitions, aggregation unit, and procedures are developed. Computer programs are developed to handle the data for the system. The data system (EDSARS) will make a useful tool for all segments of the urban environment by putting all generally useable data in one place with one set of definitions and aggregated on one useful module, utilizing one set of data handling procedures.

The basic unit of data collection was established on a parcel basis, thereby providing a high degree of flexibility in data aggregation.

The conceptual development of information theory as it applies to urban data systems is first explored. The actual conceptual development of EDSARS is explained next, followed by the operational procedures needed to utilize the EDSARS system. An explanation of the computer programs utilized in the operation of EDSARS is discussed in the operations chapter. The actual data definitions, codes and computer program listings are found in the appendices.

INTRODUCTION

The Need

The rapid growth that has occurred in this country since World War II has led to a genuine concern for the urban decision making process. It has been recognized that better data are needed in order to make appropriate decisions in the changing urban environment. As a result, a wealth of information has been gathered about the urban area. Almost every facet of urban life has been examined. Data have been collected on many aspects, from the health of the individual to the number of trips he makes. Until recently, most of this information has been gathered by a specific agency or committee for its own use. Individual definitions for data characteristics have prevailed. Definitions of land use density, for example, can range from trips generated per acre to people per square foot of floor space. The definition has depended upon the information user. The result of this multiplicity of data definitions and uses is a hodgepodge of data, collected many times by many agencies without knowledge of each other's efforts (1).*

Public agencies gather much of their data for normal operations; these data are potentially very useful to other

---

*Numbers in parenthesis refer to numbers in list of references

agencies at little additional cost, if only common definitions and parameters could be established. Without these common definitions and parameters each agency sees the urban environment only in the perspective of its narrowly defined information requirements (1).

Each urban area has developed a multiplicity of plans to channel the growth of the area in a manner that is deemed best for the community as a whole. Up to the present, just as the different agencies collect and use their own data, so do the various urban studies. While a Recreational or School Plan may use much of the data collected in a Transportation Study, the difference in data definitions and aggregation units makes the information nearly useless for any study other than the one that collected the data.

Many segments of the urban environment desire information on the community. The present means of getting this information is to go out into the urban area and collect the data directly. Any company, organization, or group that now wants data on the community must collect the information itself or accept the narrow definitions of data now established by existing governmental groups or studies that have collected data for their own purposes.

In order to facilitate the use of data by other than the primary information receiver, a set of universally compatible definitions is needed. This set of definitions is not impossible to develop if one attempts to direct the collection of "pure" data. The term "pure" simply means that the information should not be aggregated before collection. For instance, when square feet of space is collected, it should be recorded as square feet, not square feet per some other dimension. For example, square feet per employee may be useful to an industry, but square feet of building and number of employees is much more useful for planning purposes while still serving the purpose originally intended.

The data system that is developed below seeks to develop a tool for urban decision making that utilizes data from many sources and makes this information available and useable by other sectors of the urban community.

The Scope

This project involves the development of an urban data system for an area of approximately 100,000 population. The Lafayette-West Lafayette area is used to demonstrate application. The first developmental problem involves choosing the degree of sophistication needed for such a system. This involves choosing a particular level in a hierarchy of data

system complexity. Once the level of sophistication has been decided, the basic data collection and aggregation module must be chosen. The data to be used will be decided along with specific definitions for each data item. How these data can be entered into the system will be developed along with updating procedures to keep information current. A logical and easily useable means of data storage and retrieval will be developed to facilitate the use of the system by a wide variety of users.

This project will explain, in detail, the conceptual background of an information system and will describe the application of these concepts to the Environmental Data Storage and Retrieval System (EDSARS). The data items to be collected are then defined. The format for these data is explained along with detailed instructions on the initialization, updating and retrieval procedures. All the computer work for EDSARS is done on the Purdue University Computer Science Center Control Data Corporation Model 6500 computer. The coordinate digitizing procedures that are outlined use the spatial coordinate digitizer of the Joint Highway Research Project at Purdue University, which is a Benson-Lehner V Digital Coordinautograph.

THE URBAN DATA BANK CONCEPT

Information Theory

The applied science now known as information theory applies concepts of systems analysis, mathematical and statistical analysis, and computer programming to the storage, retrieval and analysis of information. The term "information" is used in a general sense, for information theory actually concerns itself with a hierarchy of information.

Information Hierarchy

The first stage of this information hierarchy is known as raw data; these raw data include numbers, symbols, lines, etc., generally on paper, that are not yet organized into a machine record. The second state is banked data; these data are organized on cards or tape, and are machine processable. The third state is a data library where the data are edited and established in machine records; these are manipulated into a format amenable to updating, search, and retrieval as organized information (2).

Levels of Sophistication

Just as a hierarchy of data exists so do various levels of system sophistication. An information system may

contain only tabulated data. The next step beyond tabulated data is the incorporation of a monitor system with specialized models. Built into this system will be models with certain known relationships between data parameters. This then becomes a tool to study the effects in specialized areas, of changes in these data parameters. After the model level of sophistication is the monitor system with simulation. In this system, the actual world is represented by mathematical models and formulations, thereby enabling the systems to calculate the overall effect of changes in data parameters (3).

The degree of sophistication is also influenced by the type of computer system used. The most elementary information system may not use a computer. In this case, all tabulation and aggregation would be done manually. This degree of sophistication can still benefit from the incorporation of information theory concepts.

The second step in the level of computerized sophistication is the use of a general purpose computer with package programs for data handling. A general purpose computer language is used with the data storage devices (tape) being mounted into the system for each inquiry (4).

The third level of sophistication utilizes a general purpose computer with an exclusive direct access (disk or

drum) storage. A problem oriented computer language is utilized. An information system with this level of computer sophistication enables file manipulation, data retrieval, and reporting with relative ease (4).

The fourth level of sophistication incorporates an on-line, time-shared computer system. Time-sharing enables many users to have direct access to the computer at the same time. Utilizing a file-oriented and problem-oriented programming language, this type of system has direct access to computer storage (4).

The fifth level utilizes a special purpose on-line computer system. This type of system is special purpose with respect to the type of data incorporated and to the program and query language used. Large data processing jobs can be accomplished by a system at this level (4).

The sixth level of sophistication incorporates specially designed hardware and software and an on-line Cathode Ray Tube (CRT). The physical computer installation and programs to utilize the computer are specifically designed for the job at hand. The Cathode Ray Tube enables direct digitizing of coordinate data and facilitates higher efficiency in the handling of spatial data (4).

Use of An Information System

An information system should give access to its data that is both logical and functional. Without these characteristics of access the system would not be useable. Functional access involves the efficient location and retrieval of subsets of the stored information, and also involves the ability to aggregate, combine and transform data. This facility is essential so that the user of the system can mold the data into a form useable for a particular purpose. Logical access insures that a comprehensive scheme for data description and documentation exists (5, 6).

Application of Information Theory to Urban Information Systems

In the development of an information system for use by the urban planning community, the specific users of the system should first be ascertained (5). The system should be user-oriented, that is, people in the urban environment without a computer programming background should be able to use the system. The data incorporated into the information system should be based on the theoretical formulations that best explain the ecological system to which they belong (7).

In developing the facility of a user-oriented urban information system, many computer languages have been developed

to enable a non-programmer to access the system. SPAN, Statistical Processing and Analysis System, is such a language. SPAN was developed for the Penn-Jersey Transportation Study (now called the Delaware Valley Transportation Study) by the Systems Development Corporation. Mark III File Management System from Informatics, Inc.; COLINGO, Compile On Line and Go, from the Mitre Corporation; Integrated Data Store, from General Electric; GIS, Generalized Information System, from IBM; are general data handling languages that are not designed specifically for urban studies but might perhaps be adapted to this purpose. A new language for the urban study community called QUEST, Query of Spatial-Temporal Data, is now under development and should broaden the scope of data handling abilities for urban information system (8, 9, 4, 10).

Urban Data System Development

System Facilities

A data system for urban studies can utilize the following facilities:

1. A data library organized for easy search, access, retrieval, editing, and expansion of the data base.
2. A library of mathematical programs by which data can be analyzed and manipulated.
3. A set of graphical procedures for representation of results.

4. A data structure by which to describe urban problems and designs.
5. A set of orders and procedures which would help in the design and operation of experiments and simulations.
6. A repertory of programs and a facility for programming to help in the evaluation of plans and decisions (11).

System Requirements

In order to develop an urban data system, certain basic functional requirements must be met. The requirements are:

1. Develop a list of data items that are required by the system users for operations and decision making. Select only items available on a continuing basis. This list is not meant to be final; the system should be arranged so that data can be added or deleted later.
2. Develop a set of standard definitions for the data; each potential user should be aware of the exact definition of each data item.
3. Provide for cross-reference systems which link data in different parts of the system.
4. Establish specific collection responsibility to each department.
5. Coordinate the data flow of the entire system (1).

An urban data system, while being designed primarily for the planning function, must be amenable to a wide variety of users. As the system becomes used by more segments of the urban environment, the system itself will grow in power and usefulness. Each potential user is also a potential data source, and cooperation between the source groups is paramount in the success of the system (1).

System Development

The actual development of the data system should follow a logical procedure. An outline of this development could be:

1. Establish data collection and file maintenance procedures prior to file creation. This eliminates from consideration data that cannot be updated.
2. Establish data control procedures to edit data. Information from the system must be accurate. Inaccuracy in data can lead to distrust in the system and eventual elimination.
3. Test the system by inserting a limited amount of data and running a test problem. Testing should grow from using a relatively small amount of data to using larger quantities in steps - with checks for internal and external consistency being made at each interval.

4. Consider expansion and use of new technical advances and techniques. The system should be flexible enough to incorporate these changes without major modification (1).

System Establishment Criteria

In developing the information system, certain criteria must be considered for establishment. These criteria lead to the specific choice of system sophistication and actual data to be incorporated. The criteria are as follows:

1. The purpose of the information and its relationship to the goals and objectives of the users.
2. The essentiality of the information.
3. The cost of the information.
4. The maintenance of the information.
5. Reduction of data to useful terms.
6. Applicability of the data to the policies, plans, programs and effectuation of the system users.
7. Relation to sophistication of tools available.
8. Receptivity of planning group and policy makers.
9. Relation of the planning body to decision makers (3).

In establishing the data system, the goals and objectives of the community, and of the information system should be thoroughly established and understood. Once the

goals and objectives are established, the entire environmental system should be monitored. Measurement units for the data can then be established: individual, family, census block, parcel, census tract, school districts, etc., are all candidates for measurement units. Norms for geographical entities must be established in order to understand the significance of the data collected. Once the entire environmental system is understood, the measurement unit established, norms established, and level of sophistication chosen, then the decision on exactly what data is to be collected is ready to be approached (3).

Three developmental approaches exist for the organization of the spatial data required in an urban information system. The first approach involves taking an inventory of the kinds of data that are presently being collected and incorporate these data into a unified system with multiple functions. The second approach concerns itself with the enumeration of questions to be asked of the data system and then the design of a system which can provide the answers. The third approach is that of conceiving generalized capabilities for handling classes of data and answering classes of questions (9). The approach that is used depends upon the other criteria and factors that must be considered for system development.

Standardization and Coordination of Data

In developing an urban data system, the paramount consideration is to establish the modulus of data collection and insure the coordination of data. In order to standardize and coordinate data, the specific data to be collected must be understood. The data to be collected, however, can depend on the modules of collection and methods of aggregation. These two considerations - module establishment and data to be collected - must be considered simultaneously. Both intimately depend upon the development and establishment considerations mentioned above. Understanding the environmental system is the overwhelming requirement.

Data Coordination Methods

Coordinating data in an urban information system is accomplished by tagging the data. The tag given to a piece of data identifies it as a unique entity thereby enabling the information to be used and coordinated with other unique pieces of data in the system. Alternative methods of tagging data can be categorized into two broad areas: name method, and location method. In the name method of tagging, all data is keyed to a particular module name such as a street address. Characteristics of the name method are such that it may not have full territorial coverage, it may have

unequal module areas, irregularly shaped areas or areas of unequal population size. The name method could be an address code of dwelling units or a consecutive numbering of zones. All data would be keyed to a particular address or zone number. This method need not have any internal logic, e.g. street names usually have no logical order, zones could be randomly numbered. No direct computations for coordination can be established using the name method because of lack of internal logic. Any areal computations must have external logic applied to coordinate the name and the locations of a module. The name method enables data to be described on a basis that is directly understandable to the user, i.e. political district, planning area, census tract, street address, etc. Developmental boundaries must be established before actual data collection. Aggregation is automatic in the name method, since all data are directly keyed to the module (12, 13, 14).

The location method of tagging data involves spatially locating each data bit within the development area. An example of location coding is an X-Y grid superimposed over an area; this would enable any point in the area to be described by a set of X-Y coordinates. A Z coordinate could be added for coding height. The characteristics of the location method of tagging data are such that: boundary

conditions are secondary, one can furnish coordinates to refer to any location, and coordinates tell precisely where a point is located. The location code gives almost automatic statements of density; the coordinates could be chosen so that exactly one square mile is enclosed - any aggregation would then give "per square mile" figures directly. Full territorial coverage of the geographical universe is easily obtained by the location method. Points can be added or deleted without altering the reference value of the system; by virtue of its nature the location method is a built-in indicator of the location of a point within the development area. Mathematical measurements of distance, direction, area, proximity, and centrality can be obtained inherently from a system utilizing the location method (12, 13, 14).

The two methods, name and location, can and probably should both be used. The location method is more flexible; boundaries can be stated after data collection; the name method provides for direct aggregation because all data are gathered on this basis. Many queries of the system will be made on a name basis; street addresses are the most common description of a parcel or a dwelling unit. In order to make the information broadly useable, the name and location methods should be coordinated; an example of this would be the establishment of a street address - geographical code index

which would relate all addresses to location coordinates (12, 14).

By combining the two tagging methods, the computational advantages of the location method can be realized while still having the advantages of the widely used descriptions of street address or zone number (name method). The location code will enable a particular urban data system to become compatible with systems of other areas. As state and national geographical code systems become operational, an urban data system utilizing the location method can be adapted to the larger system by simple mathematical coordinate changes. The key here is to join mathematical efficiency and user understanding in the tagging system (13, 14).

Choice of Data Module

In the urban data banks that were studied, the module of collection most used was the parcel. The parcel was chosen from a long list of possible modules. The census block, census tract, street block, block face, transportation zone, etc., are all possible candidates for collection module. The parcel was chosen because it provides a flexible, multi-purpose base from which to work. The physical and social data incorporated in an urban data system can easily be keyed to the parcel. Both tagging methods, name and location, can be readily adapted

to the parcel; street address can suffice for the name tag and grid coordinates of the parcel centroid are adequate for the location tag. Most data incorporated in an urban information system originates at the parcel level so that the parcel becomes a natural unit of aggregation. The parcel is defined as all contiguous land under one ownership and one general land use (1, 15).

Data Dimensions

With the data module chosen, attention must now be focused on the dimensions of the data to be collected. Basic dimensions of data fall into three broad categories: phenomena dimension, location dimension, and time dimension. In a grid coordinated data system, the location dimension is determined by the grid interval. The time dimension of the data in an urban data system should be current since all of the information should be updatable. The phenomena dimension, then, is the only dimension of major concern at this point (9).

In order to preserve flexibility in the data system, information must be gathered in terms of several dimensions. The type of data dimensions that are needed in this case are termed "pure dimensions;" "pure" simply means that no

aggregation takes place at the time of data collection. If information is collected at the parcel level, all data should be "per parcel." In order to facilitate "pure dimensions" in an urban data system, the Metropolitan Washington Council of Governments has developed a definition of land use that is in basic terms which therefore can be represented by data with "pure dimensions." This type of approach can then be extended to all of the data in an urban data system. The Council of Governments has established that land use should contain the following concepts:

1. Activity - type of use such as residential, commercial, industrial, church, etc.

2. Ownership - public, semi-public, commercial, etc.

3. Intensity of use - single family, high rise, vacant, etc.

4. Aesthetic quality - condition of structure, nuisance characteristics, health hazards, etc.

5. Restrictions on use - governmental contractual, zoning, covenants, etc.

6. Public services - utilities, etc.

7. Financial value of land and improvements.

8. Location - over, underground, accessory, adjacent, downtown, off-street, etc.

9. Type of structure - detached, high rise, walk-up, etc.(13).

By incorporating these basic concepts, data can be collected that can be aggregated in different ways for different uses, thereby giving the information system its needed flexibility. This conceptual definition of land use leads to data with the following "pure dimensions:"

1. Type of activity
2. Type of structure
3. Type of ownership
4. Intensity of use
5. Restrictions on use
6. Aesthetic quality
7. Nuisance characteristics
8. Economic functions (13)

Organization of Parcel Information

In determining the information to be incorporated into the system, one can catalog the components of change in the urban area and determine the data needed to describe this change. The components of change can be broken down in the following way:

A. Physical Change
    1. Private
        a. Housing supply

        - b. Number of industrial plants
        - c. Mining activities
        - d. Commercial activities
        - e. Private open land changes
        - f. Transportation changes
        - g. Etc.
    - 2. Public
        - a. Schools, playgrounds
        - b. Other community facilities
        - c. Streets and highways
        - d. Etc.
- B. Economic Change
    - 1. Public
        - a. Urban renewal investment
        - b. Effect of change in family income
        - c. Property values
        - d. Tax revenue
        - e. Public investment
        - f. Etc.
    - 2. Private
        - a. Housing expenditures
        - b. Mobility
        - c. Land value
        - d. Etc.

C. Social Change
    1. Education needs
    2. Population
        a. Number
        b. Characteristics
    3. Social problems
    4. Public Policies
    5. Welfare
    6. Etc. (3)

Other components of urban change include: accessibility, time, communication, and visual and aesthetic qualities. Accessibility directly influences the potential growth of an area. The passage of time must be recognized as gross changes occur in the community. Changes in transportation and other types of communication cause rapid change in an urban area. Visual and aesthetic qualities directly influence the growth of an area; visual depressants and stimulants must be recognized (3).

With these components in mind the actual organization of the data at the parcel level can now be accomplished. The Metropolitan Data Center Project organizes the parcel record into three categories:

1. Parcel information
2. Land use information

3. Space use information (1)

The parcel information will contain data on the land itself, the type of ownership, restrictions, etc. Land use information describes the structure or structures on the parcel. Space use information explains the uses and characteristics of establishments within each structure. These levels of information will become clearer as the exact information to be collected is explained (1).

List of Data Items by General Category

The Metropolitan Data Center Project is again representative of many of the data systems that were studied. The list below is not exhaustive, but points to the specific type of information under consideration. A list of this information is as follows:

I Parcel Information

- A. General parcel information
    - 1. Location information
        - a. Parcel number
        - b. Grid coordinates
        - c. Address
    - 2. Political jurisdictions
        - a. Municipality
        - b. School district

3. Planning statistical area
    a. Census block
    b. Census tract
    c. Community
    d. Urban renewal project
    e. Industrial district
    f. Origin - destination zone

B. Parcel Characteristics

1. Size
    a. Average depth
    b. Average width
    c. Area
    d. Frontage
2. Tax and economic factors
    a. Business personal property value
    b. Date of last sale
    c. Dollar amount of exemptions
    d. Improvement value
    e. Tax exempt status
    f. Total value
3. Other characteristics
    a. Distance from front of parcel to center of street

        - b. Landmark
        - c. Neighborhood characteristics
        - d. Presence of nuisances
        - e. Site characteristics
        - f. Street area
        - g. Street classification
        - h. Utilities
    - C. Parcel Use Data
        - 1. Comprehensive plan use
        - 2. Customer off-street parking spaces
        - 3. Employee off-street parking spaces
        - 4. Land use code
        - 5. Year of new water meter connection
        - 6. Year of building permit
    - D. Zoning Data
        - 1. Current zoning
        - 2. Current zoning area
        - 3. Previous zoning
        - 4. Zone change request number
        - 5. Zone variance case number
- II Land Use Information
    - A. General Building Data
        - 1. Building condition
        - 2. Building location

3. Building setback
4. Estimated cost of rehabilitation
5. Frontage of building
6. Number of elevators
7. Number of rooms
8. Presence of plumbing
9. Type of construction
10. Year built

B. Building Floor Data

1. Area of first floor
2. Gross floor area
3. Net floor area
4. Family income
5. Number of floors
6. Number of dwelling units
7. Number of residents
8. Number of rooms for rent
9. Presence of a basement

III Space Use Information

A. Non-residential data

1. Attributable parcel acreage
2. Commercial off-street parking spaces
3. Establishment location code

4. Establishment name
5. Floor level
6. Floor space utilized
7. Number of employees
8. Number of establishments
9. Peak shift number of employees
10. Space use code
11. Vacancy

B. Residential Data
(Collected in summarized form under Land Use Information)(1)

This list defines what data were collected by the Metropolitan Data Center Project and in what general category these data were placed. The exact classification of some of the data differs from other data systems but the approach is generally representative (1, 15).

Data Maintenance, Retrieval and Updating

Definition of Data

Before any information can actually be collected and placed in a data system, it must be definitely and exhaustively defined. If the data is to be stored in numerical form, as is generally the case in existing data systems, then non-numerical data must be given a numerical code. The numerical code is directly dependent upon the exact definition of

the data. Each unique definition is given a numerical code which can later be keyed back to that specific meaning (15, 16, 17).

After data has been defined and converted to a numerical code, then initialization procedures can be developed. At this point, the data handling programming languages mentioned previously become applicable (14, 9, 4, 10).

Data Organization

Data must be organized so that the system can be initialized, but also so that the information can be maintained, updated, and retrieved. The organization of data for retrieval (and the other functions) can take one of two alternative paths:

1. Location addressing

   A mapping function is derived which relates a piece of data and its storage address within the data system

2. Serial files

   A list of data is developed and data are found by their relative position in the list. The list may be unordered or ordered; the ordered list may be ordered on some property which will increase the efficiency of search. One can test against this property to determine position in the list (10).

The efficiency of the data files can be improved by providing a parallel file where a property or piece of data is stored sequentially with a correlation to the entire data entity. This parallel piece of data can be searched and when the desired characteristic is found, the correlation will give the location of the rest of the information on this data module. A list structure that links one piece of data to the next can also improve efficiency in data handling. Each data item contains a pointer to the next data item, and also an indication of the previous item in the list. This, then, gives the list the facility of being able to branch out. Two lists can also be merged by this method; also, physical sequence is not necessary as in the non-linked list (10, 18).

The establishment of the data organization leads to the development of updating procedures. Updating the information involves utilizing the available programming languages (or the development of a new language) to exchange old data for new as current and more complete information becomes available.

Retrieval Mechanisms

Retrieval mechanisms based on the type of data incorporated and the file structure can now be established. Retrieval must be facilitated on a logical and a spatial basis. Logical retrieval involves the retrieval of data based on a

characteristic other than spatial; an example would be the retrieval of information on all parcels with a particular land use. This type of retrieval must be provided for in the internal logic of the data system.

Spatial retrieval can involve three place types of retrieval regions:

1. Coordinate region

"Coordinate regions are an exhaustive partitioning of the study surface into uniform spatial areas whose dimensions equal the fineness or accuracy of the coordinate region" (9). An example of retrieval based on a coordinate region would involve obtaining information on a parcel with coordinates (X, Y).

2. Query region

"Query regions are arbitrarily delineated places. These regions are expressed as polygons and are a grouping of coordinate regions" (9). A transportation zone defined by the coordinates of its boundaries is an example of a query region with the parcels within the transportation zone being the coordinate regions.

3. Uniform data region

"Uniform data regions are arbitrary areas that are defined to be homogenous and relate a single phenomenon to places" (9). All land under a particular ownership is an example of a uniform data region.

Conceptual procedures for spatial data retrieval have been developed in varying degrees of complexity. Dueker, Shirmat, Dial, and Loomis have each developed a procedure to test if a particular coordinate pair (coordinate region) is within a given polygon (query region). The usefulness and complexity of each of the methods differs. The usefulness being dependent upon the computational accuracy needed (10).

Adaptation of Concepts

The conceptual background and information on existing urban data systems is quite large. The existing systems do not seem to be abreast of the newest concepts, however. The task undertaken by this project is to apply the concepts of information theory to a new and conceptually sound urban data system. The data system developed below is the result of an evaluation of past successes and failures in existing data systems. It is the result also of a definitive review of applicable theory. The Environmental Data Storage and Retrieval System (EDSARS) that is developed below is conceptualized from the point of view of the planning community. Application of the system is meant to encompass a much wider scope than just the planning function, however; the developmental approach will follow nearly the same outline as the

conceptual development. System complexity will be chosen first. Decisions on system development, data coordination, data modules, exact data to be collected, data definitions, initialization, storage, retrieval and updating will be made respectively along with explanations of the conceptual and pragmatic reasoning for each decision. An explanation of the physical operation will then be outlined which will, hopefully, render EDSARS operationally feasible for any interested community or organization.

DEVELOPMENT OF THE ENVIRONMENTAL DATA STORAGE AND RETRIEVAL SYSTEM

Level of Data Sophistication

The decisions in actually developing an urban data system follow approximately the same format as the conceptual development. The information used in EDSARS is taken from the level in data hierarchy of a data library. Banked data, which is another level in the information hierarchy, are organized into machine records but need not be functional or logical in format. The data library information is logical and functional in format and can be updated, searched, and retrieved; these requirements are essential for any urban data system.

Level of System Sophistication

The three levels of system sophistication vary in the complexity of models incorporated. The first level uses no models, the second utilizes specialized models, while the third level uses simulation. EDSARS, being an attempt at developing the initial phase of an urban data system, utilizes the first level of sophistication. The system contains tabulated data but no specialized or simulation models. It is felt that the model requirements will evolve from the

demands of the users on the data system. The addition of models to the system can be made within the present format; the data in the system will directly feed any models developed in the future.

The computer hardware that is incorporated also influences the level of system sophistication. EDSARS utilizes the CDC 6500 computer at Purdue University. This is a general purpose computer; the programming language used is Chippewa Fortran. The data system can be initialized and information retrieved or updated by merely submitting the correct program deck to the computer science center. The updating retrieval or initialization will be run just as any other job that is submitted to the computer. The information for EDSARS is now stored on tape. As the system is initialized and the amount of stored information grows, the incorporation of a "disk pack" will become feasible. A "disc pack" is a mountable disc storage device that enables direct random access of information. This direct access feature will save valuable computer time when the system searches large quantities of data.

The decisions on the level of system sophistication were the result of many factors. Models were not incorporated into the system because of the necessity of actual data to test the validity of a model. This project outlines the

initialization of EDSARS without actually inserting real data. The amount of data needed to initialize the system makes initialization another entire project of at least one to two years in duration. Once the initialization is complete, then the addition of models can be considered.

The decision of using the CDC 6500 computer was made in light of the hardware available. Purdue University now has an IBM 7094 computer which could handle a data system such as EDSARS. However, the 7094 is a second generation computer; this type of computer is now in the process of being phased out by many organizations; being replaced by a "third generation" computer such as the CDC 6500 computer. Any work done in the future on data systems will most probably be done on the more advanced equipment such as the CDC 6500. The use of Chippewa Fortran was the result of the author's knowledge of the language and the fact that the Fortran developed for the CDC system is quite efficient in its data handling capabilities.

Data Module

The data module chosen for EDSARS is the parcel. This aggregation module seems to be almost the universal choice by existing urban data systems. The parcel provides a flexible, multi-purpose base from which to work. The data to be incorporated into an urban data system are easily keyed

to the parcel. The tagging methods, which will be discussed below, work well with the parcel module. The parcel forms a very useful aggregation unit in that it is the largest common denominator that can be used to build zones. Any zone in an urban area can be represented fairly accurately, by a composite of parcels. This gives the system maximum flexibility in the designation of zones while containing a minimum number of data units.

The parcel in EDSARS is defined as all contiguous land under one ownership and one general land use. This definition closely parallels the parcel used in assessors records. If two adjacent pieces of land are owned by the same person and used for the same purpose, they would be listed as one parcel. If two adjacent parcels had different uses, they could be listed as two parcels. This definition, being general, allows a certain measure of ambiguity in the designation of a parcel; the system has the facility, however, of being able to join two or more parcels into one new parcel, or break up one parcel into two or more parcels. This facility for redefining parcels allows the system to establish its own equilibrium as the data are used and reevaluated.

A special definition of the parcel is utilized when coding rights-of-way. Each street segment and utility right-of-way is coded just as any other parcel. A street or

right-of-way is broken down into block long segments if the block length is 500 feet or less; if the block length is longer than 500 feet, the block is broken down into segments of 500 feet or less. An intersection is taken as a street parcel. The parcel boundaries are defined as the right-of-way line for the street segments. An example of an area divided into parcels can be found in Figure 1.

Data Tagging Methods

EDSARS uses both the name method and location method of tagging data. The name tag utilized is the street address of the parcel. The street number, name and type (e.g. Drive, Street, Lane, etc.) are all noted in the name tag of the parcel. For rural areas, the street number is replaced by the rural route number, and the street name is replaced by "Rural Route". The name method of tagging gives the system the facility of locating data for the user on a basis that is familiar to all segments of the urban environment. Street addresses are universally known and understood, and, therefore, enable all potential users to be familiar with at least one retrieval method.

Street segments are coded by the street name and the number (in hundreds) of most of the houses on the street segment. A street segment along a street called Main Street, where house numbers go from 100-225 would be coded as

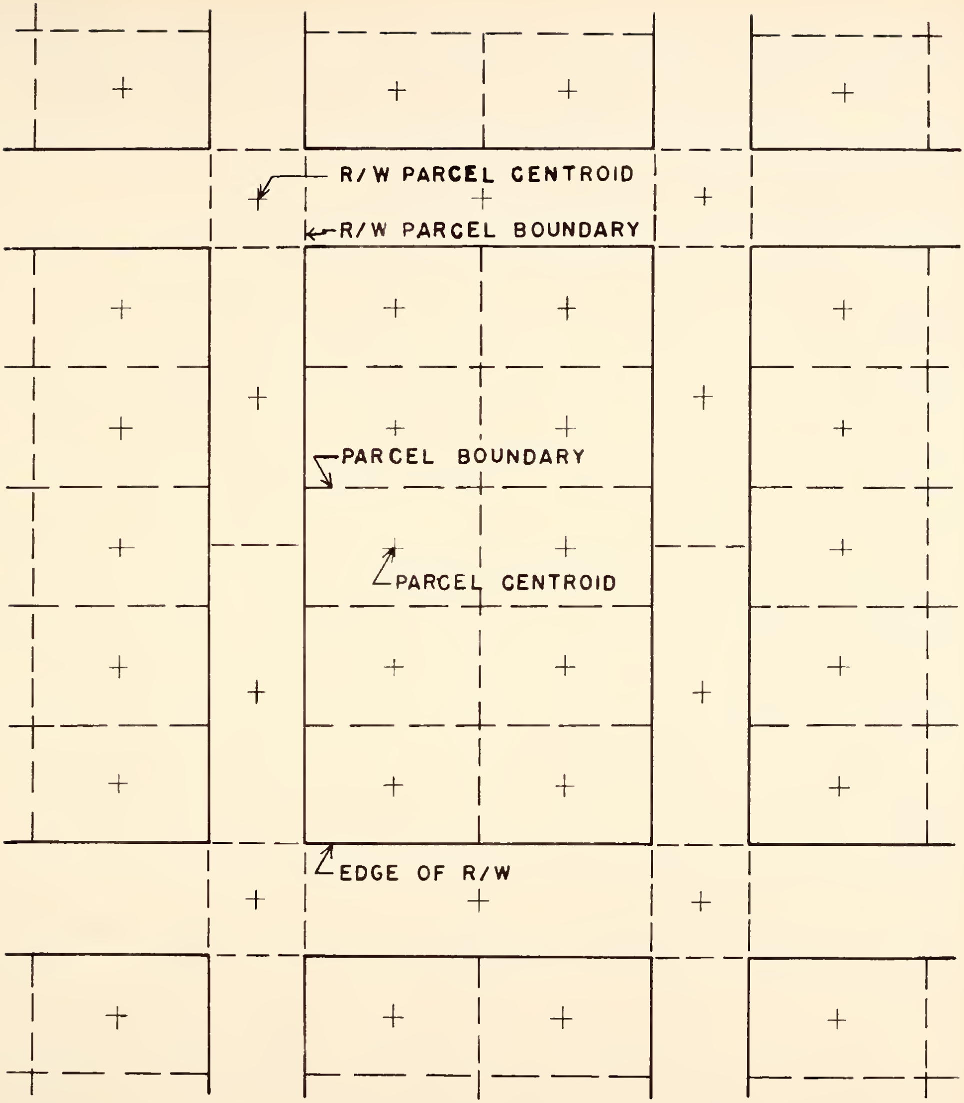

FIGURE I. SEPARATING AN AREA INTO PARCELS FOR DATA CODING

100B Main Street. This indicates that this is the one hundred block of Main Street. This gives the benefits of the name tag to street segments as well as individual parcels.

The location tag utilized by EDSARS is a rectangular grid coordinate system which is superimposed over the entire development area. The grid coordinate uses one foot as the basic unit. The parcels and street lengths are tagged by the coordinates of their approximate centroid. The actual digitizing of the coordinates is accomplished by an automatic coordinate digitizer. The operation of this device will be explained under the Operations section of this report. By utilizing a location tag, internal logic is added to the data in EDSARS. The coordinates facilitate the retrieval of data on an areal basis. Data for certain geographical segments of the development area can be directly retrieved with the use of the coordinates. Density computations become immediately possible with the use of coordinates.

The utilization of rectangular grid coordinates provides another very useful capability. A zone, such as a Census Tract or Transportation Zone, can be represented by the grid coordinates of its boundary. This is accomplished by representing the zone by a series of triangles and digitizing the coordinates of the vertices. The exact operational procedures will be described under the Operations section of this report.

By representing zones in this way, a dictionary of zone names and grid coordinates is developed. When any information is desired on a zonal basis, the coordinates of the zone are read and each parcel is tested to establish whether or not it lies within the zone in question. The information for each parcel within the zone is then retrieved and aggregated thereby giving information on the desired zonal basis.

In order to coordinate the actual data incorporated into the system and the tags for each parcel, a dictionary with the parcel number, street address (or block number for street segments), and grid coordinates is developed. The actual data are stored in conjunction with a parcel number. The data are related to the name and location tags through the parcel number-street address-grid coordinate dictionary. The parcel number is merely a unique number of 1 to 6 digits given to each parcel. The numbers need not be consecutive or have any logical order. The only requirement is that each parcel have one and only one unique number.

Data Dimensions

The definition of land use developed by the Metropolitan Washington Council of Governments was utilized to aid in determining the data needed to define the different areas of land use. Data were examined in the light of how well

they defined:

1. Type of activity
2. Type of structure
3. Type of land use
4. Intensity of use
5. Aesthetic qualities
6. Restrictions on use
7. Nuisance characteristics
8. Economic functions (13)

In order to completely describe the urban environment, the information on each parcel is broken down into three categories:

1. Parcel Information - information on the parcel itself, including dimensions, restrictions, zoning, use, etc.

2. Building Information - information on each building on a parcel, including age, value, type of construction, condition, size, etc.

3. Establishment Information - specific information on each unit within a building such as a business, a dwelling unit, etc., including space use, number of employees, number of residents, age of residents, number of vehicles, etc.

Data Items

With the tagging methods established, the module chosen, and the data categorized within the parcel, it now becomes possible to choose the actual data items to be incorporated into the system. The methodology for this is three-fold:

1. Examine data collected by existing urban data banks.

2. Establish the data needed for all urban planning functions.

3. Query local planners as to data needed for operations and planning.

Once a complete list of data is collected by the above means, a thorough evaluation of each data item is needed to establish its usefulness, its cost of collecting, and its ability to be updated.

To determine the types of data collected for existing data banks, a study of literature on existing and planned urban data banks was made. From this literature, a list was made of data collected. These data were then categorized under Parcel, Building or Establishment information. Data needed for all phases of urban planning was then examined. A case study was made of the Louisville Metropolitan Area Transportation and Development Study to determine the data collected for this project (19-32). The type of data needed

for a comprehensive Environmental Health Plan was determined (33). General notes on the data collected for other urban studies, including a Recreational Plan, School Plan, Urban Renewal Plan, Major Thoroughfare Plan, Transportation Plan, Land Use Plan, and an Economic Development Plan, were studied for the data needed (34). All listed data items were then appraised by local planners. The data incorporated, listed by general category, are as follows:

I Parcel Information

1. Land use
2. Ownership
3. Frontage
4. Area
5. Year of subdivision
6. Assessed value of land
7. Easement
8. Landmark
9. Neighborhood characteristics
10. Land appearance
11. Number of structures
12. Year of zoning change
13. Zoning
14. Zone change request number
15. Variance number

16. Comprehensive Plan use
17. Utilities
18. Parking spaces
19. Loading area
20. Assessed value of improvements
21. Total assessed value
22. Sale date
23. Sale price
24. Nuisances

(The following data are collected for street segment parcels)

25. Intersection
26. Length of segment
27. Right-of-way width
28. Pavement width
29. Functional class
30. Structural composition
31. Per cent grade
32. Average daily traffic
33. Number of accidents
34. Traffic control signs and signals
35. Speed limit
36. Curb parking regulations
37. Curb type
38. Sidewalks

39. Number of lanes
40. Loading zone
41. Bus route
42. School route
43. Access control
44. Condition

II Building Information

1. Year built
2. Type of construction
3. Type of structure
4. Building condition
5. Year of latest building permit
6. Cumulative cost of building permits
7. Number of floors
8. Total floor area
9. Basement
10. First floor area
11. Number of dwelling units
12. Building setback
13. Required Setback
14. Rehabilitation cost
15. Type of building code violation
16. Number of building code violations
17. Number of establishments

III Establishment Information

1. Space use
2. Total number of employees
3. Peak shift number of employees
4. Optimum total employment
5. Number of rooms for rent
6. Number of residents by sex and age group
7. Family income
8. Vehicles owned
9. Police calls
10. Fire calls
11. Welfare payment
12. Number of communicable diseases
13. Type of communicable diseases
14. Rent

A complete list of all data incorporated along with its possible source, use, and description can be found in Appendix I. Each piece of data that was entered into the system was judged to be important to the planning community, able to be updated, and relatively easy to collect. Data that were too expensive to collect or not updatable were not incorporated into the system.

With this developmental background now complete it becomes possible to explore the actual operation of EDSARS. The following section can be considered as the "Operations Manual" for this data system. All phases of initialization and utilization of the system are discussed in detail. It is assumed that with the general background given in the previous sections and the specific operational procedure explained in the following section that EDSARS can be initialized by any interested community or organization.

OPERATION OF EDSARS

Data File Characteristics

The data in EDSARS are established in three separate files. The first data file contains parcel numbers, parcel grid coordinates and parcel addresses. Each parcel is given a unique number to identify it as a data entity; this number is correlated to the grid coordinates of the approximate parcel centroid and the street address of the parcel by the Parcel Number-Grid Coordinate-Address File. The second data file contains the parcel number and all general data on that parcel. The data for each parcel are correlated to the street address and grid coordinate via the parcel number. The third data file contains zone names and the coordinates of the zone boundary.

These three data files make up the data storage portion of EDSARS. The actual data is stored on tape and can be manipulated by a set of package programs. The first set of programs is used to initialize the system by reading cards and writing the information on tape. The second set of programs is used to incorporate more data items when they become available. The third set of programs is used to read the data tape and write on paper. This set of programs is used to check the other program sets and to give a complete

list of all data in the system. The fourth set of programs is used to update the values of data items in the system when current information becomes available. The fifth and final set of programs is used to retrieve information from the system for special user purposes. The following is an explanation of the package programs and procedures for using them in EDSARS.

General Program Information

Each of the programs discussed below is used to manipulate the data in EDSARS. When data cards are to be read into the system, a card with "7, 8 and 9" punched in column one must follow the main body of the program and precede the actual data cards. When reading General Data cards, the last card should have a "99" in columns seven and eight. This indicates end-of-data to the system. The last data card in the Zone-Grid Coordinate File, and the Parcel Number-Grid Coordinate-Address File should be blank to indicate end-of-data to the system. The last data card is followed by a card with "6, 7, 8, and 9" punched in column one. This indicates end-of-program to the computer. If no data cards are used in a program, the "6, 7, 8, and 9" card immediately follows the main body of the program.

The actual format of the data in the system is explained in Appendix I. Appendix I has a complete list of all information in the system along with a brief description of the data item, possible source, system name for the data item, system format for the item, and its possible use. Appendix II explains all codes used for data items in EDSARS.

Data File Initialization

Parcel Number-Grid Coordinate-Address File

The initialization of the Parcel-Number-Grid Coordinate-Address File occurs first. To initialize this file, the coordinate digitizer of the Joint Highway Research Project at Purdue can be utilized. An accurate base map of the entire development area is placed on the digitizer and a point 1,000 feet south and 1,000 feet west of the southwestern corner of the development area is set as point (0, 0). Key points on the base map are then digitized; the digitizer will give readings in inches and these readings are then converted to feet; the conversion depends upon the scale of the map utilized.

The key points that are digitized should be the intersection of street center lines if these are available. The actual digitizing of parcel coordinates will take place on more accurate maps. The key points that are located on the

base map are digitized on the more accurate maps, and the coordinates of these key points serve as reference coordinates for the digitizing of all parcels.

Each map to be digitized, other than the base map, should first be broken up into parcels and approximate centroids located as shown in Figure 1. Consecutive parcel numbers are then written on the map for each parcel. The map is placed on the digitizer, its key point located (for coordinate conversion to the base system), and then each parcel centroid can be digitized. The digitizer will punch the parcel number and the grid coordinates on an IBM card which can then be fed into the computer for coordinate conversion.

The data cards for actual initialization of this data file are read into the system via Program I, Appendix III. The data cards for this file should have the format shown in Figure 2. This figure can also serve as a sample coding sheet. The parcel number is placed in columns 1-6. The X coordinate is placed in columns 8-13, and the Y coordinate in columns 15-20. The street or rural route number of the parcel is placed in columns 22-27. If the parcel is a street segment, the block number is placed in columns 20-26 with a "B" in column 27 to indicate "street block". All of these

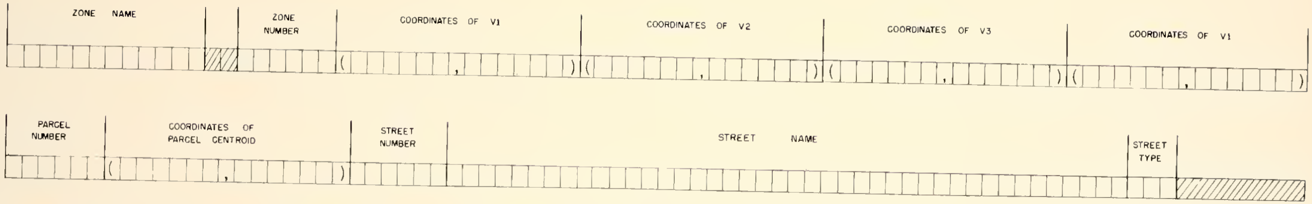

FIGURE 2. FORMAT OF ZONE NAME - GRID COORDINATE CARD AND FORMAT OF PARCEL NUMBER - GRID COORDINATE - ADDRESS CARD

numbers should be right justified. Columns 30-69 contain the street name or "Rural Route". The name should start in column 30 and be punched on the card just as it appears in the town directory with one column between each word in the name. The type of street is coded in columns 70-72. An explanation of this code can be found in Appendix II. When more information becomes available, Program 2, Appendix III is used to read more data cards into the system. This data file locates all of the parcels in the development area and coordinates the parcel location and street address to a particular parcel number. This number is the identifying tag in the system used to locate all data that pertain to this particular parcel.

General-Data File

The file for general data is initialized after each parcel in the development area has been given a unique number. The format for General Data cards can be found on Figure 3; this figure can also serve as a sample coding sheet. The 01 card is used for every parcel in the development area. The 02 card is used where the parcel has a use other than right-of-way. A 12 card is used in place of the 02 card when a parcel is a right-of-way. If the parcel has multiple land use, zoning or comprehensive land use, an 11

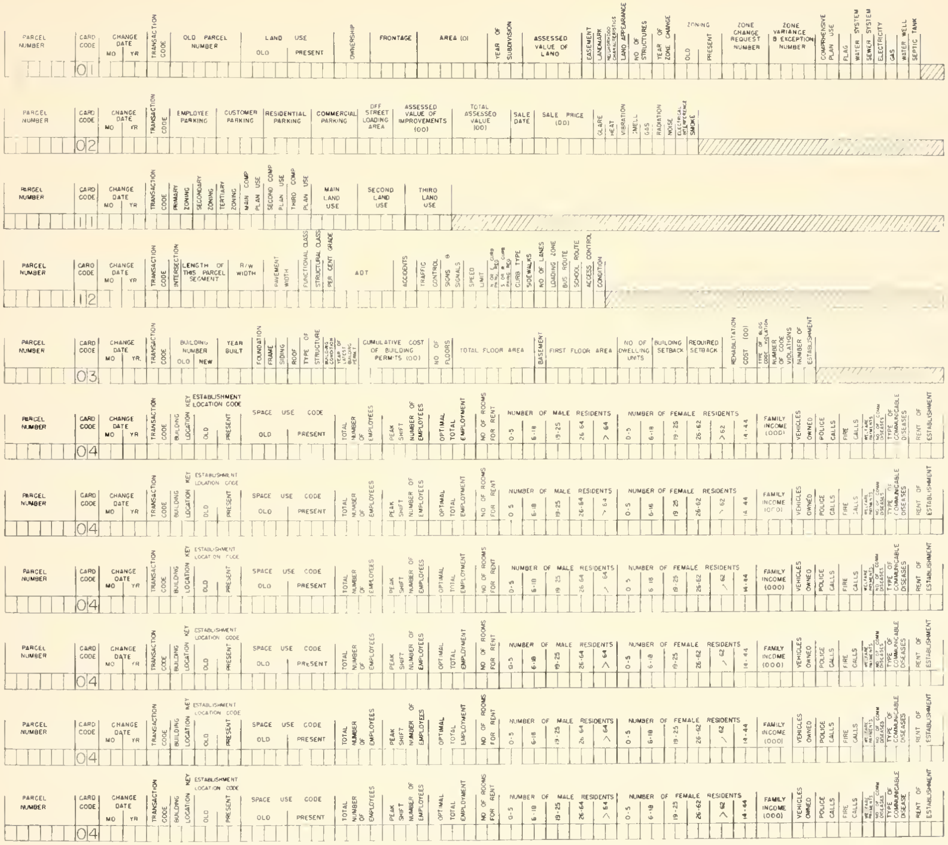

FIGURE 3. FORMAT OF GENERAL DATA CARDS

card is used to supplement the 01 and 02 cards. Each building on a parcel is represented by the information on the 03 card, and each establishment (dwelling unit, business, office, etc.) in a building is represented by an 04 card. The information in the General Data File is broken into three categories. The first category is land use information and is represented by the 01, 02, or 12, and 11 cards; the second category is building information which is represented on the 03 card, and the third category is establishment information which is represented on the 04 card.

Each data item in the system is given a specific name. This name is used to refer to the particular data item within the system.

A detailed explanation of these data with definitions, location, format and data item name can be found in Appendix I. The format for these data cards is shown on Figure 3.

Each building on a parcel is given a number to uniquely identify it; if four buildings exist on one parcel, they would be numbered 1-4. Each establishment within a building is also given a unique number to identify it. Building numbers start at one, with each separate parcel; establishment numbers start at one, with each separate building. Program 3, Appendix III is used to initialize this data file

by reading data cards and writing the information on tape and paper as a check. Program 4, Appendix III is used to read in more information as it becomes available.

Zone-Grid Coordinate File

The last file to be initiated is the Zone-Grid Coordinate File. To define a zone, its boundary is located in the development area by the grid coordinate system. The zone is broken up into triangles and the grid coordinates of each of the three vertices are coded on data cards. The card format is shown in Figure 2. An example of a zone broken into triangles can be found in Figure 4. The coordinate of the vertices are placed on the data card by numbering the vertices 1-3. Point one is coded first, followed by point two, point three, and point one again. The first and last coordinate must be the same in order to close the triangle. The identifying zone name is placed in columns 1-12, the zone number is placed in columns 15-20. The coordinates of the vertices are placed in columns 22-80 in the format shown on Figure 2. The zone name starts in column 1. The zone number and grid coordinates are right justified. Program 5, Appendix III is used to initialize this file by reading data cards and writing the data on tape, and paper as a check. Program 6, Appendix III is used to read more information into

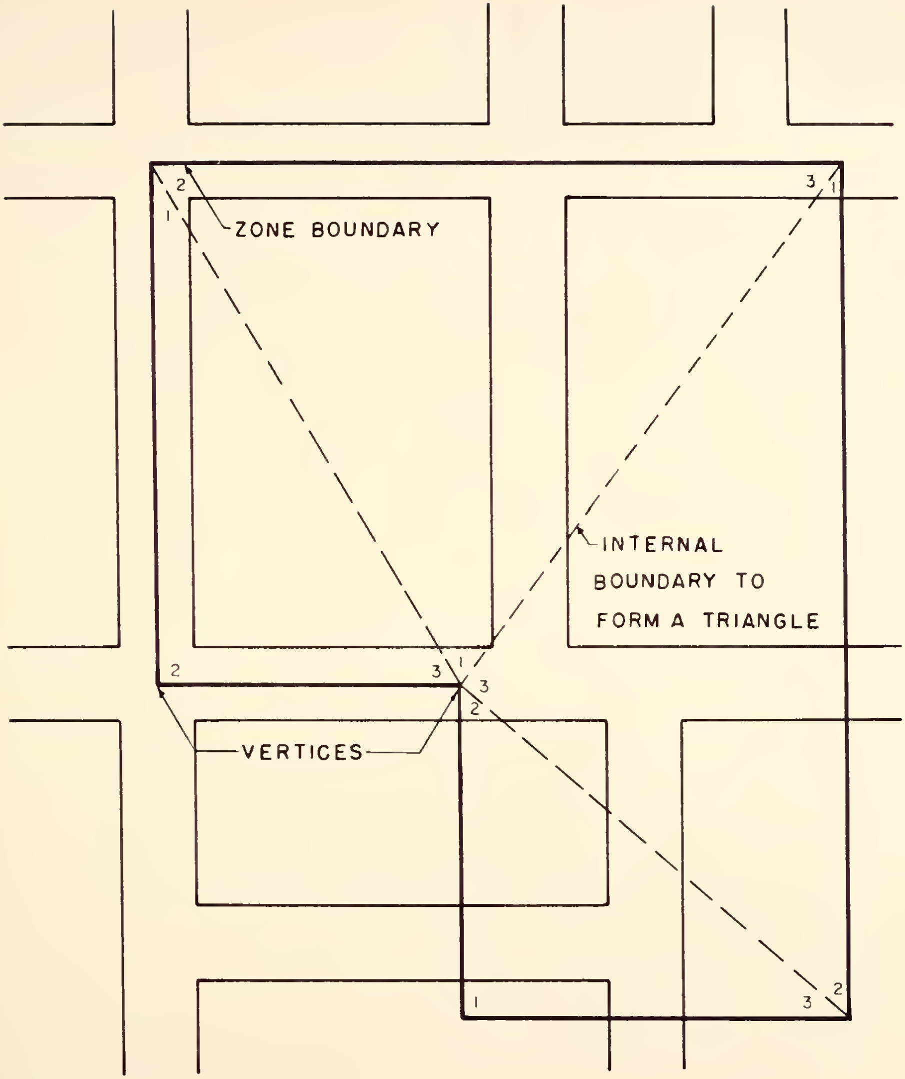

FIGURE 4. ZONE DIVIDED INTO TRIANGLES FOR DATA CODING

the system as it becomes available. It should be noted that this file can contain as many zonal systems as required by the users. Census Tracts, Transportation Zones, School Zones, etc. are all examples of possible zonal systems that could be incorporated into this file. The inclusion of a particular zonal system is dependent upon the potential use of its parcel aggregation.

Read Programs

There is a general class of programs in EDSARS that will read the data file tape and print the information on paper. These programs should be used after reading in more data or updating the system to check the accuracy of the tape file. These programs can also be used to obtain a complete list of all information on the tape. Program 7, Appendix III will read the Parcel Number-Grid Coordinate-Address file and print a complete list of the tape file. Program 8, Appendix III will read the General Data file and print a complete list. Program 9, Appendix III will read the Zone-Grid Coordinate file and print a complete listing of this information.

Update Programs

In order to change any of the information in the system or update the information, a set of update programs has been developed to replace the old information with the new. This

is accomplished by using the initializing programs to make a tape file of the new information. This new information file and the original file are then used to initialize a new tape file with all of the new information incorporated into it.

All of the update programs require that the new data cards be identical to the original in format. The new cards should be complete - all information that is not changed should still be punched on the update card. The new information is punched on the card replacing the old in the same format. These cards are then used to form the update file. Any data card that has no data changed need not be entered into the update file, but any card that has any piece of information changed must be completely repunched with all of the new and unchanged information.

Updating the Parcel Number-Grid Coordinate-Address File

In order to update this file, Program 1 is used to read the new data cards and write a New Information File. These data cards must be in the same format as the original and be complete with the new information inserted in place of the old. The New Information File, the original file, and the tape which will become the updated file are then mounted on

the computer and Program 10, Appendix III is run to update the file. This program changes only the data that are to be updated. All data that are still valid from the original program are written in their original form on the updated file. This means that if street numbers were changed for only one block in the development area, new cards would be made only for that particular block. These new cards would be read into a New Information File and then by using Program 10, Appendix III this new information would be incorporated into the total file giving a complete updated file where the only information that was changed was for the block in question. Program 7, Appendix III should then be used to print a listing of the updated file to insure its accuracy.

Updating The General Information File

To update this file, Program 3, Appendix III is used to read the new information and write a New Information File. This New Information File and the original file are then used to write a new General Data File. The updating program for this file is Program 11, Appendix III. Program 8, Appendix III is then used to make a listing of the updated data file to insure its accuracy.

Updating The Zone-Grid Coordinate File

This file is updated by reading the new information and writing it on tape via Program 5, Appendix III. The New Information File, along with the existing tape file are used by Program 12, Appendix III to write an updated Zone-Grid Coordinate File. Program 9, Appendix III should then be used to check the accuracy of the updated file by writing out a complete listing. The updating of this file can take place by redefining the boundaries of a particular zone for a specific zonal system. If a zone name is changed, an entirely new file must be written by Program 5 without the cards from the deleted zone and with cards for the new zone.

Retention of Old Data Files

A decision on how many old data files should be kept needs to be approached at this time. Data files represent current data for a certain period of time. The comparison of data files for different time periods can yield useful information on trends that exist in the development area. It is felt that files should be updated at least once a year. These yearly files should be retained for at least a period of five years. The final decision on this policy is, of course, up to the initializing agency.

RETRIEVAL PROGRAMS

To retrieve information from the data files for special purposes, there are a set of programs in EDSARS which give specific information for the special purposes of the user. Programs 7-9 will give a complete listing of an entire data file, but this is quite often no more useful than the raw data cards. Programs 13-18, Appendix III are designed to be general in their characteristics so that specific user needs can be satisfied. The programs are flexible enough so that they can be modified as user needs permit. The first four programs discussed below retrieve information from the General Data File; the next two retrieve information from the Parcel Number-Grid Coordinate Address File. The last program retrieves information from the Zone-Grid Coordinate File.

Retrieve List of X and Y

Program 13, Appendix III will retrieve a list of any two parameters from the General Data File. All information will, of course, be on a parcel basis. With this program the user can retrieve a list of land use and customer parking spaces, for instance, to determine the trend in types of land use providing parking for customers. The format for each parameter (X and Y) is entered into this program. The variable name is also entered into the general program along with the

maximum number of items in the list and the data card type that the information is on. The listing of this program in Appendix III indicates where these parameters must be entered. The variable name, format and card type are explained in Appendix I for each data item.

Retrieve Sum of Y for a Specific X

If a parameter is to be summed for a particular value of another parameter, Program 14, Appendix III is used. An example of application would be to sum customer parking spaces for local business type of land use. The value of the X parameter which the sum is to be taken over is entered into the program along with the variable name being summed and the variable name being summed over. The data card that each parameter is on is also entered into the main program along with the format of each variable. The format for these entries is clarified by the program listing in Appendix III.

Retrieve List of Y for a Specific X

A program that can provide a list of one data item based on a particular value of another data parameter is often useful. The list of residents by parcel with residential land use is a possible application of this type of program. Program 15, Appendix III will list any variable Y, for any

specific value of another variable X. The variable name for X and Y, and their format, along with the specific value of X that is listed over, and the maximum size of the list are entered into the main body of the program. With these parameters the program will then give the desired list. The program listing in Appendix III indicates where the proper information is to be entered.

Retrieve X for Specific Parcel Numbers

Any data parameter can be retrieved for a specific parcel number by using Program 16, Appendix III. The variable name to be listed and its format, along with the number of parcels in the list are entered into the main program. With this information the program will retrieve the desired data. This program is used in conjunction with the next two programs which yield parcel numbers based on other data parameters.

Retrieve Parcel Number for Specific Addresses

The parcel number for a parcel with a specific address will be retrieved by Program 17, Appendix III. This program will read addresses that are submitted to it and will print out the address, parcel number and grid coordinates for each specific parcel. The address cards that are fed to this program must start the street name in column 7 with one space

between words in the name. The street number should be right justified in columns 1-6; the street type should be coded in columns 49-51. Any number of addresses can be fed to this program and the parcel number and grid coordinates will be retrieved. The number of addresses being searched must be entered into the main body of the program as shown in Appendix III. The output cards from this program can be fed directly to Program 16, which retrieves General Data based on parcel numbers. These two programs give the system the facility of retrieving general data on a street address basis.

Retrieve Parcel Number for a Specific Zone

Program 18, Appendix III will give a complete listing of zones and the parcels that are within these zones. The inputs for this program are the Zone-Grid Coordinate File and the Parcel Number-Grid Coordinate-Address File. The output from this program can be fed selectively to Program 16 thereby giving the system the capability of retrieving general data on a zonal basis.

Flexibility of Programs

The programs discussed above are general in nature and are meant to be a start of a complete retrieval package. More programs will certainly be added to the retrieval package as user needs become evident. The programs that have been outlined here are meant to be flexible and easily changed for specific user needs. Any of the retrieval programs that retrieve on the basis of a data parameter being equal to a certain value can be changed to retrieve data for a parameter greater than or less than a certain value by merely changing the statement that tests the X parameter. These statements now read IF(X.EQ.TEST) which means "if X equals test." If this statement is changed to IF(X.GE.TEST) the program will retrieve information for X greater than or equal to a certain value (TEST). If information is required for X less than or equal to a certain value, the expression would be IF(X.LE.TEST). Many different programs can be built from the basic six retrieval routines explained above. Consultation of any basic Fortran manual will reveal how this can be done. This does not mean that one need be a programmer to use or change the programs, however; the manual can usually give the needed information even if one does not know the Fortran language.

In order to run these programs, the users manual for specific computer must be consulted. Each particular installation has different requirements for control cards; these are explained in the users manual.

After examining the conceptual development and the operational characteristics of EDSARS, it is felt that an organization or community could use the work presented here as the basis for an urban data system. Specific needs and capabilities will probably change some details, but the approach and application explained above should be broadly applicable to the task of initiating a unique planning tool that should greatly increase the efficiency of handling planning data while making this information available to a much broader segment of the urban environment.

CONCLUSIONS

The following conclusions about EDSARS and its potential can be made:

1. EDSARS should facilitate efficient and economical handling of planning data for the area of about 100,000 population.

2. The utilization of a general purpose computer and general purpose programming languages should make EDSARS available to most metropolitan areas in the United States.

3. The concept of a unified data system is the most important contribution of EDSARS.

4. The data proposed for EDSARS is the most useable and easily obtainable information available to the urban area.

5. The incorporation of a flexible method of representing zones by their location is essential to an efficient urban data system such as EDSARS.

6. The information for an urban data system should be in three separate files so that one file can be updated and improved without disturbing the other files.

7. Zone names and boundary locations should comprise one file; parcel numbers, parcel location, and street address should compromise another file, and the third file should be

made up of general data.

8. The best unit for data collection is the parcel.

9. The data system should be flexible so that improvements can be made as use and technology increase.

10. The streets and rights-of-way should be represented as special parcels in order to insure full territorial and information coverage.

11. All data incorporated should be potentially useful and updateable.

12. Utilization of applicable theory and practical experience of existing data systems are needed to develop a useful, efficient and improved data system.

The concepts that are represented by these conclusions when tied together into an urban data system such as EDSARS give the planning community and the urban environment as a whole a flexible and useful tool which should make more information available to more people at a much lower cost and with much less effort.

RECOMMENDATIONS FOR FURTHER RESEARCH

EDSARS, and most other urban data systems can be improved most effectively by the development of a programming language that can handle urban data more efficiently. A computer language is needed that can be understood by the planner and have the capability of efficient data handling. The multitude of data to be incorporated into EDSARS makes research in this area a highly profitable undertaking in terms of time and money saved in handling data. As EDSARS becomes operational, models should be incorporated into the system. At first the models could be specific in nature. When the specific models have been developed, they could be incorporated into a more sophisticated simulation model. The ultimate type of model that can be forseen at this time, which could be incorporated into EDSARS, would be a model which automatically could give changes in predictable parameters as the system is updated. An example might be a simulation model that, among other things, would give the change in future land use caused by the change in data read in as update information today. This model could be sensitive to changes in population, land use, etc., and would be able to detect these changes at each update cycle and predict the effect of these changes on future land use.

As EDSARS is used and specific retrieval procedures become common, these procedures should be made more efficient by the use of special purpose programs. The present programs are general in purpose and therefore serve all purposes adequately, but certainly more efficient methods for specific uses could be derived.

EDSARS should be a dynamic system from its inception. As common uses and retrievals become evident they should be made more efficient; as new technology in programming or data handling is developed, it should be incorporated. It should be remembered that EDSARS is not a series of computer programs, it is a concept of information handling made operational; if the concept is remembered, then EDSARS and other systems like it will exist and grow long after the initial crude methods of data handling have been discarded for better and more efficient methods.

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APPENDIX I

APPENDIX I

DATA ITEMS: DESCRIPTION, USE, SOURCE, SERVICE, FORMAT, AND SYSTEM NAME

Section A: General Data Items

The general Data File contains all of the information on the parcel. The 01 and 02 cards contain information about the land itself. The 12 card contains supplementary information on street and right-of-way parcels. The 11 card contains supplementary information when the parcel has more than one land use, zoning classification, or comprehensive plan use. The 03 card contains information on each building on a parcel. The 04 card contains information on each establishment to within a building.

01 Card

Col. 1-6, Parcel Number

Each parcel in the data system is given a unique number. This number is used to identify the parcel within the system. Parcel numbers require no logic in their assignment other than the fact that each parcel must be assigned a unique number.

The use of the parcel number is internal bookkeeping in the data system.

The source of the number is internal to the system.

The system name is PNO, and the format is I6.

Col. 7-8, Card Code

Each data card is identified by a card code, on this card the code is 01. The card code identifies what data is placed on this card. Card code 01 and 02 denote parcel information, card code 03 denotes building information; card code 04 denotes establishment information. Card code 11 denotes supplemental parcel information; card code 12 denotes right-of-way information. There will be one 01 card for each parcel, one 03 card for each building on a particular parcel, and one 04 card for every establishment within the buildings on a parcel.

The use of the card code is to tell the system what kind of data is placed on this data card.

The source of the card code is internal to the system.

The system name is CRDTYP, and the format is I2.

Col. 9-12, Change Date

The number of the month and last two digits of the year of the most recent data change are placed here. Each time the data is updated or changed on this particular card, a new change date is placed in these four columns.

This data is used to tell how recent the information on the card actually is.

The source of this data is internal to the system.

The system name is CHANGE, and the format is I4.

Col. 13-14, Transaction Code

The transaction code indicates which data were changed during the last updating cycle.

The use of the transaction code is to help explain changes in data items and describe the updating that takes place.

The source of the transaction code is internal to the system.

The system name is TRANCD and the format is I2.

Col. 15-20, Old Parcel Number

The old parcel number is used to keep continuity in the parcel records. If parcels are split or joined, the old parcel number gives the number that the data was previously associated with.

If a parcel is subdivided into smaller parcels, one of the new parcels is given the parcel number of the previous larger parcel and the same parcel number is placed in the old parcel number columns. This, then indicates that this parcel has the same number as a parcel which previously had different information. The other subdivided parcels are given new parcel numbers which were not yet used in the system. The number of the parcel with which they were previously associated is put in the old parcel number columns. If parcels are joined to make one

new large parcel, then the new parcel takes the number of one of the parcels which will be joined and the old parcel number is recorded. This gives a similar indication to that previously explained; this parcel has the same number but since an _old parcel number_ exists, this tells the system user that this parcel number was previously associated with a different physical entity. The other parcels that are joined take on a new parcel number and their previous numbers go in the _old parcel number_ columns.

The source of the old parcel number is internal to the system.

The system name is OLPNO, and the format is I6.

Col. 21-28, Land Use

The present land use is coded in columns 25-28; the previous land use is coded in columns 21-24. The land use will aid in: determining actual land use trends, the coordination of zoning and actual land use, the coordination of Comprehensive Plan use and actual land use, and estimating traffic generation characteristics. If more than one land use exists on the parcel a (1) is placed in column 72 and the multiple land uses are coded on data card 11.

The source of this information is existing land use maps, assessors cards and field check.

The system name for the present land use is NULUSE: the system name for the previous land use is OLUSE, and the format for each is I4.

Col. 29-31, Ownership

The type of ownership that exists on this particular parcel is coded here. This code tells whether the ownership is private, public, corporate, state owned, etc. This information will give indication of tax status of land and extent of types of ownership.

The source of this information will be assessor's cards.

The system name is OWNER, and the format is I3.

Col. 32-35, Frontage

The linear feet of frontage on a traveled road or R/W is defined as the frontage; this does not include the frontage on an alley, it does include the frontage on both streets adjoining a corner lot.

These data will be used to compute linear feet of curb, linear feet of streets, and will aid in density computations.

The source of these data will be the assessor's cards and Sanborn maps.

The system name is FRONT, and the format is F4.0.

Col. 36-41, Areas

The area of the parcel in tens of square feet is placed here. This is the physical area of the parcel from boundary to boundary. Calculations for intensity of use, areas of each land use, etc., will be based on this figure.

The source of this information will be the assessor's cards.

The system name is AREA, the format is F6.0.

Col. 42-44, Year of Subdivision

The last three digits of the year of parcel subdivision are placed here. The year that this parcel was created by subdivision is indicated here to give an indication of residential growth. This will indicate a magnitude of growth and a direction of growth.

The source of this information will be assessor's cards, zoning records and maps.

The system name is YRSUB and the format is I3.

Col. 45-49, Assessed Value of Land

The assessed value of the parcel land as listed on the assessor's card is placed here. This figure will be used in economic analysis computations, and computations of the effects of certain environmental factors on land value.

The source of this information is the assessor's cards.

The system name is ASVAL, and the format is F5.0.

Col. 50, Easement

Any easement that exists on this parcel is coded in col. 50. The code explains the type of easement that exists - scenic, utility, recreational, etc. This gives an indication of any encumbrances on the land that may hinder development.

The source of these data will be the utility companies, deeds and plat books.

The system name is EASEMT, and the format is I1.

Col. 51, Landmark

This data item indicates whether there exists any special historically or architecturally significant structures on the parcel. This information will be used in determining the suitability of the parcel for redevelopment or other proposed projects.

The source of this information will be a field check, and residents' opinions.

The system name is LNDMK, and the format is I1.

Col. 52, Neighborhood Characteristics

The extent of blight in a neighborhood will be coded to aid in determining the effect of blight on this parcel. Cost, maintenance, etc. can be viewed in a more clear context when

neighborhood characteristics are known.

The source of this information will be a field check and the area redevelopment plan.

The system name is NEIGH, and the format is I1.

Col. 53, Land Appearance

The appearance of the landscaping and maintenance of the land itself will be coded here to help establish the effect of land appearance on land value and other blight factors.

The source of this information will be a field survey.

The system name is LND, and the format is I1.

Col. 54-55, Number of Structures

The number of structures that exist on this parcel is placed here to indicate to the system how many building data cards exist in this data record. This information will be used to insure internal consistency in the data.

Source of this information will be the assessor's cards and Sanborn Maps.

The system name is NOSTRT, and the format is I2.

Col. 56-57, Year of Zone Change

The last two digits of the most recent zoning change on this parcel are recorded here to give an indication of

land use changes and to coordinate the data bank information with the zoning files.

The source of this information will be the zoning files.

The system name is YRCH, and the format is I2.

Col. 58-61, Zoning

The present zoning that exists on this parcel is coded in columns 52-53. The previous zoning for the parcel, if a change has occurred, is coded in columns 50-51. The zoning will give an indication of land use trends and the correlation that exists between actual land use and zoning. If the parcel is split by land use zones a (1) is placed in column 72 and the description of the multiple zones is placed on data card 11 (explained below).

The source of this information is the zoning maps and records.

The system name for the present zoning is NUZON, and the system name for the previous zoning is OLZON. The format for each is I2.

Col. 62-65, Zone Change Request Number

The most recent zone change request number for this parcel is placed here to aid in the coordination of data bank and zoning records.

The source of this information is the zoning records.

The system name is ZONREQ, and the format is I4.

Col. 66-69, Zone Variance and Special Exception Number

The number of the most recent zone variance or special exception request number for this parcel is placed here to aid in coordination of data bank and zoning records.

The source of this information is the zoning records.

The system name is ZONVAR, and the format is I4.

Col. 70-71, Comprehensive Plan Use

The use that the comprehensive plan outlines for this parcel is coded here to indicate the land use growth patterns for the area. This information will enable a direct correlation to be studied between existing land use, existing zoning, and future use as outlined by the comprehensive plan. If the comprehensive plan splits the parcel into multiple land uses, a (1) is placed in col. 72 and the multiple uses are coded on data card 11.

The source of this information is the comprehensive plan maps.

The system name is COMUSE, and the format is I2.

Col. 72, Flag

This column is used to indicate whether multiple zoning, comprehensive plan, or land use exists on the parcel, a (1) in col. 72 indicates that a 11 data card exists to explain the multiple categories.

The source is internal to the system from zone, comprehensive plan and land use information.

The system name is FLAG, and the format is I1.

Col. 73, Water System

The type of water system that exists is coded here. This information will tell whether the water supplied to the parcel is from a public system, a private system or no system. The existence of a water well is indicated elsewhere. This information will aid in determining the extent of service provided by local water systems, and potential areas of need can be determined.

Public and private utility records, field check, both are sources of information.

The system name is WATER, and the format is I1.

Col. 74, Sewer System

It is indicated here whether or not a public sanitary sewer or a private sanitary sewer exists on this parcel. The existence of a storm sewer is also incorporated into this code. This information gives an indication of areas served by storm sewers; this will aid in determining areas of potential need.

Public utility records, city engineer records, field checks, will be sources of this information.

The system name is SEWER, and the format is I1.

Col. 75, Electricity

This information will tell whether or not electricity is available to this parcel. This gives an indication of areas of potential need for this service. A (2) in col. 75 indicates existence of this service; a (1) indicates the absence of this service.

Field check and public utility records are sources of this information.

The system name is ELECT, and the format is I1.

Col. 76, Gas

This information indicates whether natural gas is piped to this parcel. This will indicate not whether gas is used

by the parcel but whether it is available to the parcel. The areas of potential need can be investigated using this information. A (2) in col. 76 indicates existence of this service; a (1) in col. 76 indicates the absence of this service.

Public utility records and field check are sources of this information.

The system name is GASS, and the format is I1.

Col. 77, Water Well

To give an indication of the utilities available to a parcel, the existence of a water well is coded here. This will help obtain a picture of the type of utilities serving each parcel. A (2) in col. 77 indicates the existence of a water well; a (1) in col. 77 indicates the absence of a water well.

The source of this information will be a field check.

The system name is WELL, and the format is I1.

Col. 78, Septic Tank

The existence of an on the premise septic system is coded here to complete the picture of the utilities serving each parcel. A (1) in col. 78 indicates the absence of a septic tank; a (2) in column 78 indicates the presence of

a septic tank.

The source of this information will be a field check.

The system name is SEPTIC, and the format is I1.

02 Card

Col. 1-14

These are all bookkeeping items indicative of all data cards and are explained under the 01 card description.

Col. 15-18, Employee Parking

The number of parking spaces for employees of establishments on or near the parcel is stated here. This will aid in parking needs studies and traffic generation figures.

A field check will be the source of this information.

The system name is EMPARK, and the format is I4.

Col. 19-22, Customer Parking

The number of parking spaces for customers of specific establishments on or near the parcel is noted here to aid in parking needs, studies, and traffic generation calculations.

The source of this information will be a field survey.

The system name is CUPARK, and the format is I4.

Col. 23-26, Residential Parking

The number of parking spaces on this parcel for residents of establishments on or near this parcel is noted here. This

information will aid in parking surveys and in traffic generation computations.

A field check will be the source of this information.

The system name is RESPK, and the format is I4.

Col. 27-30, Commercial Parking

The number of parking spaces on this parcel, free or for hire, available to the general public, is noted here. This will aid in parking surveys and traffic generation computations.

The source of this information will be a field check.

The system name is COMPK, and the format is I4.

Col. 31-33, Off-Street Loading Area

The number of square feet of area devoted to the loading and unloading of goods on this parcel is noted here. This information will be used to establish traffic generation estimates for this parcel.

The source of this information will be a field survey.

The system name is LDAREA, and the format is F3.0.

Col. 34-38, Assessed Value of Improvements

The assessed value in hundreds of dollars of the improvements on this parcel is noted here. This information will give an indication of the worth of this parcel and the

economic health of the region. This will also be a growth indicator of the region.

The source of this information will be the assessor's cards.

The system name is VALIMP, and the format is F5.0.

Col. 39-43, Total Assessed Value

This will be the sum of the assessed value of the land and the assessed value of the improvements, and will give a total worth figure for the parcel. This information will be used in basically the same context as the other assessed values described above.

The source of this information will be the assessor's cards.

The system name is TOTVAL, and the format is F5.0.

Col. 44-45, Sale Date

The last two digits of the year of the last sale of the parcel are noted here. This will give an indication of property turnover and will indicate the validity of the sale price figure.

The source of this information will be the tax records.

The system name is SALEDT, and the format is I2.

Col. 46-50, Sale Price

The price paid for this parcel, in hundreds of dollars at the last sale is noted here. This will give a market worth of parcels in the area, and will help give a sales versus price relationship.

The source of this information will be the tax stamps.

The system name is SALEPR, and the format is F5.0.

Col. 51-59, Nuisances

The existence of nuisances will be indicated here to analyze the influence of the factors on sale price, neighborhood characteristics, blight, and health. A (1) will indicate the absence of the nuisance and a (2) will indicate its presence; the column for each nuisance category is listed below, with format and system name:

Column	Information	Format	System Name
51	Glare	I1	GLARE
52	Heat	I1	HEAT
53	Vibration	I1	VIBRA
54	Smell	I1	SMELL
55	Gas	I1	Gas
56	Radiation	I1	RADIAT
57	Noise	I1	NOISE
58	Electrical Interference	I1	ELINT
59	Smoke	I1	SMOKE

The source of this information will be a field survey.

12 Card

Col. 1-14

These columns contain data bank bookkeeping items which occur on every card. The explanation of these items is under the 01 card description.

Col. 15, Intersection

This indicates whether this right-of-way is an intersection. This will give meaning to the following information.

The source of this information will be the base maps. A (1) in col. 15 indicates that this is not an intersection; a (2) in col. 15 indicates that this is an intersection.

The system name is INTER, and the format is I1.

Col. 16-19, Length of this Parcel Segment

Each right-of-way will be broken down into sections 500 feet long or less. The block length will be used to determine the parcel length when this is convenient. This information will enable the determination of total length of street, and total length of streets by characteristic. For an intersection, the longest dimension will be used as length of the segment and the shortest will be used as right-of way width.

The source of this information will be base maps and a field check.

The system name is LENGTH, and the format is F4.0.

Col. 20-22, Right-of-way Width

The width of this right-of-way segment in linear feet, to the nearest foot, will enable the determination of street potential for improvement and reclassification and give an indication of area of land being used as rights-of-way.

The source of this information will be base maps, field check, and the city engineer.

The system name is ROWID, and the format is F3.0.

Col. 23-25, Pavement Width

The width of the paved portion of this right-of-way segment (curb to curb) in linear feet, to the nearest foot, will give an indication of potential and need for improvement and help indicate the level of service being required. This will also aid in street classification and maintenance.

The source of this information will be base maps, field check and the city engineer.

The system name is PAVWID, and the format is F3.0.

Col. 26, Functional Class

The level of service that this street segment provides is noted here. It is noted whether this street now functions as a local, collector, arterial, etc. This information will be useful in determining the efficiency and potential of the existing street system.

A field survey will be the source of this information.

The system name is FUNCLS, and the format is I1.

Col. 27, Structural Composition

The structural characteristics of this street segment will be coded to aid in street improvements planning, traffic routing, and transportation planning. This code will describe the actual physical construction of this street segment indicating base and wearing coarse.

The city engineer and field survey will be the source of this information.

The system name is STRCOM, and the format is I1.

Col. 28, Per Cent Grade

This data item notes the number of feet that this street segment rises or falls vertically per 100 feet horizontally. This figure is described as a per cent giving an indication of needed improvements and street potential, and aiding in street classification.

A field survey will be the source of this information.

The system name is GRADE, and the format is I1.

Col. 29-33, ADT

The average daily traffic that traverses this street segment is noted here. This information will be used to determine street use and potential and aid in street classification.

The traffic engineer and field survey will be the sources of this information.

The system name is ADT, and the format is F5.0.

Col. 34-35, Accidents

The number of accidents that have occurred on this street segment will be recorded to determine high accident areas and aid in improving safety.

The traffic engineer and police records will be the sources of this information.

The system name is ACCID, and the format is I2.

Col. 36-39, Traffic Control Signs and Signals

The type of traffic control that exists on this street segment or intersection will be coded here to indicate specifically what type of traffic control exists. This information will aid in inventory and maintenance and will help in

accident and capacity research. If two traffic controls exist on this segment, e.g. traffic light and "No Left Turn" sign, the primary control will be coded in columns 36-37 and the secondary control will be coded in columns 38-39. If only one control exists, this will be coded in columns 36-37.

The source of this information will be a field survey.

The system name is TRCONT, and the format is I4.

Col. 40-41, Speed Limit

The speed limit on this street segment will be noted here to aid in street classification, capacity and accident computations.

The source of this information will be the traffic engineer and a field survey.

The system name is SPDLMT, and the format is I2.

Col. 42-43, Curb Parking Regulations

The curb parking regulations that exist on the north or east side of this street segment are coded in column 42. The parking regulations that exist on the south or west curb are coded in column 43. This information will aid in parking surveys, parking demand versus capacity regulations, safety computations and flow capacity calculations.

The source of this information will be a field survey.

The system name for the north or east side is NEPKG; the system name for the south or west side is SWPKG, and the format for each is I1.

Col. 44, Curb Type

The type of curb that exists on this street segment will be coded here to aid in the inventory of existing facilities.

The source of this information will be the city engineer and a field survey.

The system name is CRBTYP, and the format is I1.

Col. 45, Sidewalks

The type of sidewalk that exists on this street segment will be coded here. Information on the width, and existence on one or both sides of the street will be incorporated into the code. This will aid in inventory of existing facilities and provide information on pedestrian safety and capacity.

The source of this information will be the city engineer and a field survey.

The system name is SIDWLK, and the format is I1.

Col. 46, Number of Lanes

The number of lanes that exist on this street segment will be noted here to aid in capacity computations and

determination of street improvement potential.

The source of this information will be the city engineer, traffic engineer and a field survey.

The system name is NOLANE, and the format is I1.

Col. 47, Loading Zone

The existence of a curb-side loading zone will be noted to aid in determination of street volume capacity, parking capacity, and safety computations. The presence of a loading zone is noted by a two (2) in col. 47; the absence of a loading zone is noted by a one (1) in col. 47.

The system name is LOAD, and the format is I1.

Col. 48, Bus Route

The existence of a local bus route along this street segment will be noted here to aid in determining extent of service provided, and in computing street volume and capacity. The existence of a bus route is noted by a (2) in col. 48; the absence of a bus route is noted by a (1) in col. 48.

The source of this information will be a field survey.

The system name is BUSRT, and the format is I1.

Col. 49, School Route

The existence of a school walking or bus route along this street segment will be noted here to aid in correlation

to the facilities provided for walking and for safe bus pick up for school children. The presence of a school route is noted by a (2) in col. 49; the absence of a school route is noted by a (1) in col. 49.

The school board and field survey will be the sources of this information.

The system name is SCHRT, and the format is I1.

Col. 50, Access Control

The type of access control that exists on this street segment will be coded to aid in capacity and safety calculations to determine areas of potential need for change in access control and aid in determination of existing levels of service.

The source of this information will be the traffic engineer and a field survey.

The system name is ACCESS, and the format is I1.

Col. 51, Condition

The condition of this street segment from the point of view of maintenance needed will be coded here to aid in the determination of required maintenance and to aid in computations of existing level of service provided.

The source of this information will be the city engineer and a field survey.

The system name is COND, and the format is I1.

11 Card

Col. 1-14

These columns contain data bank bookkeeping items which occur on every card and are explained under the 01 card description.

Col. 15-16, Primary Zoning

The zoning for the most prominent use on the parcel or largest area (whichever most significant) is coded here. The significance and source of this data item is described under the 01 card explanation.

The system name is PRIZON, and the format is I2.

Col. 17-18, Secondary Zoning

The second most important zoning on this parcel is coded here.

The system name is SECZON, and the format is I2.

Col. 19-20, Tertiary Zoning

The third most important zoning that exists on this parcel is coded here.

The system name is TERZON, and the format is I2.

Col. 21-22, Main Comprehensive Plan Use

The most important land use on this parcel as determined by the comprehensive plan is coded here. The importance of

the land use can be determined either by area or significance to the study area. The significance and source of this data item is described under the 01 card explanation.

The system name is MNCOMP and the format is I2.

Col. 23-24, Second Comprehensive Plan Use

The second most important land use (as determined above) outlined by the Comprehensive Plan is coded here.

The system name is SCCOMP, and the format is I2.

Col. 25-26, Third Comprehensive Plan Use

The third most important land use as outlined by the Comprehensive Plan is coded here.

The system name is TDCOMP, and the format is I2.

Col. 27-30, Main Land Use

The primary land use (either by area or significance) now existing on the parcel is coded here. The significance and source of this data item is described under the 01 card explanation.

The system name is MNLUSE, and the format is I4.

Col. 31-34, Second Land Use

The second most important land use on the parcel is coded here.

The system name is SCLUSE, and the format is I4.

Col. 35-38, Third Land Use

The third most important land use that exists on the parcel is coded here.

The system name is TDLUSE, and the format is I4.

03 Card

Col. 1-14

These are data bank bookkeeping items and are the same for each card. A detailed explanation of these items can be found under the 01 card explanation.

Col. 15-18, Building Number

Each building on a parcel is numbered consecutively in order to uniquely identify each building. The present building number is entered in columns 17-18; if the building number has changed, the number that previously identified the building is placed in columns 15-16.

The source of this information is internal to the system.

The system name for the present building number is NUBLDG: the system name for the previous building number is OLBLDG; and the format for each is I2.

Col. 19-21, Year Built

The last three digits of the year of construction of this building are entered here to aid in developing community

growth trends. This will aid in determining potential blight and suitability for redevelopment.

The source of this information will be the tax assessor's cards.

The system name is YRBLT, and the format is I3.

Col. 22-25, Type of Construction

The materials used in the construction of the foundation, frame, siding, and roof of this structure are coded here to enable determination of potential redevelopment and suitability for new uses. The codes are placed as follows:

Foundation - Column 22
Frame - Column 23
Siding - Column 24
Roof - Column 25

The source of this information will be the assessor's cards and a field survey.

The system names are as follows: foundation - FND; frame - FRAME; siding - SIDING: roof - ROOF; the format for each is I1.

Col. 26-27, Type of Structure

The basic characteristics of the structure are coded here to enable determination of exactly what type of structures exist, e.g. detached building, arcade, attached building, etc.

This will aid in establishing exact use and suitability to present and future use.

The source of this information will be a field survey.

The system name is STRTYP, and the format is I2.

Col. 28, Building Condition

The extent of maintenance needed is coded here to aid in determining areas of blight and potential redevelopment. This information should enable the determination of potential blight before wholesale renewal is required.

The source of this information will be a field survey.

The system name is BLDCON, and the format is I1.

Col. 29-30, Year of Latest Building Permit

The last two digits of the year that the most recent building permit was issued for this building is entered here. This will give a determination of extent of upkeep and growth occurring in this building and will aid in the determination of blight and need for redevelopment. This will also show areas of growth in the study region.

The source of this information will be the city engineer.

The system name is YRPRMT, and the format is I2.

Col. 31-36, Cumulative Cost of Building Permit

The cumulative costs of construction and improvement as reflected by all of the building permits issued for this structure in hundreds of dollars is noted here to give extent of construction and growth occurring in the study area.

The source of this information will be the city engineer.

The system name is COSTPR, and the format is F6.0.

Col. 37-38, Number of Floors

The number of floors, including the basement if one exists, in this structure is noted here. This information will aid in intensity of use calculations and aid in size computations for structures in the study area.

The source of this information will be a field survey.

The system name is NOFLR, and the format is I2.

Col. 39-45, Total Floor Area

The total floor area of the building, including the basement, in square feet is noted here to obtain intensity of use figures. The square feet of floor space in each land use category will also be a product of this information.

The source of this information will be a field survey.

The system name is TOTARE, and the format is F7.0.

Col. 46, Basement

The presence of a basement is noted by a (2) in col. 46; the absence is noted by a (1) in col. 46. This information gives insight into the number of floors and total square feet previously mentioned, since these include a basement if one exists.

The source of this information will be a field survey.

The system name is BASMNT, and the format is I1.

Col. 47-52, First Floor Area

The area of the first floor of the building in square feet is noted to indicate the land coverage of the building. This is an intensity of use indication, and will aid in determining land coverage by buildings.

The source of this information will be a field survey

The system name is FSTARE, and the format is F6.0.

Col. 53-55, Number of Dwelling Units

The number of complete dwelling units (number of kitchens) that exist [illegible] this building are noted. This is an indication of residential intensity of use and aids in determining traffic generation figures.

The source of this information will be a field survey.

The system name is NODU, and the format is I3.

Col. 56-58, Building Setback

The number of feet that the building is set back from the front lot line; this is measured from the corner of the building closest to the front lot line, and measured perpendicular to the lot line. This information indicates the legality of the building location and possible interference with right-of-way activities.

The source of this information will be a field survey.

The system name is SETBK, and the format is F3.0.

Col. 59-61, Required Setback

The building setback requirements, as defined above, that exist for this parcel are noted here. This gives the legality of the actual setback.

The source of this information will be the zoning records.

The system name is REQBK, and the format is F3.0.

Col. 62-64, Rehabilitation Cost

The cost, in hundreds of dollars, of rehabilitating this building to a condition needing only upkeep maintenance. This information gives an indication of extent of blight and cost for rehabilitation.

The source of this information will be a field survey.

The system name is RECOST, and the format is F3.0.

Col. 65, Type of Building, Code Violation

The type of the most recent building code violation is coded here to indicate problem areas with this structure. This information will yield areas of potential blight and negligence of maintenance.

The source of this information will be the building inspector's records.

The system name is VIOL, and the format is I1.

Col. 66-67, Number of Code Violations

The total number of building code violations that have existed in this structure is coded here. This gives an indication of extent of violations that have existed and will aid in determining chronic maintenance problems. This will also be useful in determining potential blight.

The source of this information will be the building inspector's records.

The system name is NOVIOL, and the format is I2.

Col. 68-69, Number of Establishments

The number of establishments that exist within this building is noted here. This is a bookkeeping item to indicate how many establishment data cards exist for this structure.

The source of this information will be a field survey.

The system name is NOEST, and the format is I2.

04 Card

Col. 1-14,

These columns contain data bank bookkeeping items which occur on every card. The explanation of these items can be found under the 01 card description.

Col. 15-16, Building Location Key

All buildings on a parcel are numbered consecutively, giving each building on the parcel a unique number. The Building Location Key is the number of that building in which this establishment exists. This information is used to uniquely locate each establishment.

The source of this information is internal to the system.

The system name is BLDKEY, and the format is I2.

Col. 17-20, Establishment Location Code

All establishments within a building are numbered consecutively, giving each establishment a unique number. This number, along with the building location key and parcel number, is able to uniquely identify every establishment in the data system.

The present establishment number is placed in columns 19 and 20. If the establishment number has changed for any reason, the previous establishment number is placed in columns 17 and 18.

The source of this information is internal to the system.

The system name of the present location is NULOC; the system name of the previous location is OLOC, and the format for each is I2.

Col. 21-28, Space Use Code

The particular use that exists in this establishment is coded here. This tells specifically what type of activity exists in this establishment. This information will aid in traffic generation analysis and analysis of various types of activities on an area or number basis. The present space use will go in columns 25-28; the previous use will go in columns 21-24.

The source of this information will be a field survey.

The system name of the present use is NUSUSE: the system name of the previous use is OLSUSE, and the format for each is I4.

Col. 29-32, Total Number of Employees

The total number of full time employees that are employed ty this establishment is noted here. This information will aid in traffic generation analysis, economic forecasting and employment analysis.

The source of this information will be the employment securities division.

The system name is TOTEMP, and the format is I4.

Col. 33-36, Peak Shift Number of Employees

The number of employees working at this establishment during the peak shift (the shift requiring the greatest number of employees) is noted here. This information will aid in traffic generation computations, in parking demand determinations and economic evaluations.

The source of this information will be a field survey and the employment securities division.

The system name is PEAKEM, and the format is I4.

Col. 37-40, Optimal Total Employment

The number of people that this establishment would like to have employed under present conditions using existing facilities is entered here to determine to what extent more workers are needed in the study area.

The source of this information will be a field survey.

The system name is OPTEMP, and the format is I4.

Col. 41-42, Number of Rooms for Rent

The total number of residential sleeping units for rent (that is a unit excluding kitchen, as in hotels, motels, or rooming houses) in this establishment is noted here. This information enables determination of residences, temporary

and permanent, that would not be considered under the "dwelling unit" classification. This information will be useful in residence computations, economic analysis, and traffic generation computations.

The source of this information will be a field survey.

The system name is NOROOM, and the format is I2.

Col. 43-52, Number of Male Residents

The number of male residents residing in this establishment is noted here. This information will be used in population forecasting, work force determination and traffic generation computations. The population by age group is recorded as follows:

Column	System Name	Age Group
43-44	MOT5	0-5 years
45-46	M6T18	6-18 years
47-48	M19T25	19-25 years
49-50	M26T64	26-64 years
51-52	MGT64	over 64 years

The source of this information will be the Bureau of Census.

The format for each age group is I2.

Col. 53-64, Number of Female Residents

The number of female residents residing at this establishment is recorded here. This will be used in population forecasting, work force determination, and traffic generation computations. The population, by age group, is recorded as follows:

Column	System Name	Age Group
53-54	F0T5	0-5 years
55-56	F6T18	6-18 years
57-58	F19T25	19-25 years
59-60	F26T62	26-62 years
61-62	FGT62	over 62 years
* 63-64	F14T44	14-44 years

*child bearing age, especially useful in population forecasting.

The source of this information will be the Bureau of Census.

The format for each age group is I2.

Col. 65-67, Family Income

The total income of the family that resides at this establishment is recorded here in thousands of dollars. This information will be used in economic analysis, and traffic generation computations.

The source for this information will be a field survey.

The system name is INCOME, and the format is F3.0.

Col. 68-69, Vehicles Owned

The total number of vehicles owned by the establishment (e.g. a business) or by residents of the establishment (e.g. a private home) is recorded here to aid in traffic generation computations. This figure would include all cars, trucks, and buses.

The source of this information will be vehicle registration records.

The system name is VEHOWN, and the format is I2.

Col. 70-71, Police Calls

The total numberof police calls made to this establishment during an update period (probably one year) will be recorded here to aid in determining police needs and help in crime research.

The source of this information will be the police records.

The system name is POLCAL, and the format is I2.

Col. 72-73, Fire Calls

The total number of fire calls made to this establishment during an update period (probably one year) is noted here to aid in determining fire protection needs and aid in fire hazard research.

The source of this information will be the fire department records.

The system name is FIRECAL, and the format is I2.

Col. 74, Welfare Payments

If welfare payments are made to this establishment a (2) is placed in column 74; if no welfare payments are made to this establishment a (1) is placed in column 74. This information will aid in welfare research and extent (on an area basis) of payments made.

The source of this information will be the city and county welfare records.

The system name is WELFAR, and the format is I1.

Col. 75, Number of Communicable Diseases

The number of communicable diseases reported at this establishment during an update period (probably one year) is noted here. This information will aid in disease research and aid in determining the health characteristics of the study area.

The source of this information will be the city, county and state Boards of Health.

The system name is NODIS, and the format is I1.

Col. 76-77, Type of Communicable Disease

The type of communicable disease last reported at this establishment will be coded here to aid in disease research and give further insight into the health characteristics of the study area.

The source of this information will be the city, county and state Boards of Health.

The system name is DISEAS, and the format is I2.

Col. 78-80, Rent of this Establishment

The monthly rent paid for this establishment is recorded here to aid in determining the characteristics of the establishment, aid in deriving rental supply and demand, and help in economic analysis of the study area.

The source of this information will be a field survey.

The system name is RENT, and the format is F3.0.

Section B: Zone Name-Grid Coordinate File

The Zone Name-Grid Coordinate File identifies the boundary of all zones in the system. Each data card contains the zone name and three coordinates (the first is mentioned twice). These three coordinates define a triangle which makes up part of the total zone. Each zone is broken up into triangles which exhaustively define the total area covered by the zone

name and the coordinates for the triangle. There is only one kind of data card for the Zone Name-Grid Coordinate File.

Col. 1-12, Zone Name

The name of the zone being defined is entered or abbreviated into columns 1-12. If an abbreviation is necessary because of the space available, then a catalog of these abbreviations should be made for further reference. This name, along with the zone number, uniquely identifies the zone. The name should start in column one with one space between each word in the name.

The source of the zone name and boundary will be dependent upon the type of zones being used (school, transportation, etc.)

The system name is ZON, and the format is 2A6 (ZON also includes zone numbers).

Col. 13-14, Left Blank

Col. 15-20, Zone Number

The number of the zone being described is entered into columns 15-20. This number helps uniquely identify each zone. If a zone (such as a township or city) has no number these columns are left blank.

The source will depend upon the type of zone being entered.

The system name is ZON, and the format is A6 (ZON also contains zone name).

Col. 21-80, Boundary Coordinates

The coordinates of the vertices of the triangle are placed in columns 21-80. A parenthesis is used around each pair of coordinates with a comma between coordinate pairs.

Column	Data Item	System Name	Format
21	Left parenthesis		
22-27	X-Coordinate of point one	X (1)	I6
28	Comma		
29-34	Y-Coordinate of point one	Y (1)	I6
35	Right parenthesis		
36	Left parenthesis		
37-42	X-Coordinate of point two	X (2)	I6
43	Comma		
44-49	Y-Coordinate of point two	Y (2)	I6
50	Right parenthesis		
51	Left parenthesis		
52-57	X-Coordinate of point three	X (3)	I6
58	Comma		
59-64	Y-Coordinate of point three	Y (3)	I6

Column	Data Item	System Name	Format
65	Right parenthesis		
66	Left parenthesis		
67-72	X-Coordinate of point one	X (4)	I6
73	Comma		
74-79	Y-Coordinate of point one	X (4)	I6
80	Right parenthesis		

The source of this information is the coordinate digitizer and conversion to the base system.

Section C: Parcel Number-Grid Coordinate-Address File

The Parcel Number-Grid Coordinate-Address File relates each parcel in the development area to a particular location (grid coordinate) and a particular street address. This file gives the system the facility of locating data for a parcel on a name or location basis. Each parcel in this file should have the same number as a parcel in the General Data File where the actual data is stored. There is only one type of card in the Parcel Number-Grid Coordinate-Address File.

Col. 1-6, Parcel number

The unique number which identifies this parcel is placed in columns 1-6. This number need have no logic attached to

it, other than being unique - the parcel number in the General Data File which refers to this particular parcel should, of course, be the same.

The source of this number is internal to the system.

The system name is PNO, and the format is I6.

Col. 7, Left Parenthesis

Col. 8-20, Parcel Coordinates

The grid coordinates of the approximate centroid of this parcel are entered here. The X-Coordinate is placed in Columns 8-13. A comma is placed in Column 14. The Y-Coordinate is placed in Columns 15-20.

This information is obtained from the coordinate digitizer and conversion to the base system.

The system name for the X-Coordinate is XCOORD, for the Y-Coordinate it is YCOORD, and the format for each is I6.

Col. 21, Right Parenthesis

Col. 22-28, Street Number

The street or rural route number of this parcel is entered into Columns 22-28. If the parcel is a street segment, the number of the block (in even hundreds) is placed in Columns 22-28 and a "B" is placed in Columns 29. In the case of a regular parcel, Column 29 is left blank. This

number, along with the street name, gives a name tag to the parcel information.

The system name is ADDRES. (ADDRES also contains street name and type), and the format is A6.

Col. 30-69, Street Name

The name of the street, as listed in the town directory is placed here. One column is placed between each word in the street name. If the address of this parcel is a rural route number, then "rural route" is placed here instead of a street name. A street segment still has the name of the street entered into these columns. This name, along with the street number, block number, or rural route number will give a name tag to the parcel information.

The source of this information will be the town directory.

The system name is ADDRES (ADDRES also contains street number and type), and the format is 7A6 (includes Col. 29).

Col. 70-72, Street Type

The type of street, as listed in the street directory is coded here. Common entries here will be "Lane," "Street," "Path", etc. This information completes the street address as listed in the directory and also completes the name tag for the parcel information.

The source of this information is the town directory.

The system name is ADDRES (ADDRES also contains street number and name), and the format is A3.

APPENDIX II

APPENDIX II. DATA CODES

General Notes on Data Coding

Whenever a data item is a number (e.g., police calls, rent, sale price, etc.) and this data has not been checked, that is, not yet entered into the system, each column of this number should have a nine (9) punched to indicate that the item has not yet been entered into the system. Any code (e.g., Building Type, Foundation Type, etc.) not entered into the system would have a zero (0) punched in the column.

If a numbered data item has been checked and the actual number is 9, 99, 999 etc., then enter one less than this number is entered to indicate that this is a verified entry (e.g., 99 would be entered as 98).

Code No. 1-Land Use

COG. Generalized Land Use Code

Code	Description
0	Residential
00	Single Family (including detached, semi-detached, triple-attached and row, plus individual mobile homes)
01	Multi-Family (two or more dwellings in a single building, including apartments and residential hotels)
02	Rooming and Boarding Houses

Code	Description
03	Membership Lodgings
04	Residence Halls and Dormitories
05	Retirement Homes, Orphanges and Religious Quarters
06	Seasonal Housing (including summer cottages and farm labor camps)
07	Mobile Home Parks or Courts
08	Hotels, Motels and Tourist Accommodations
09	Other Residential
1	Industrial
11	Manufacturing and Processing
12	Research and Testing
13	Wholesale, Warehousing and Storage
14	Contract Construction
19	Other Industrial
2	Utilities (operating facilities not including offices)
21	Electric Utility
22	Gas Utility
23	Water Utility
24	Sewage Utility
25	Solid Waste Disposal
26	Telephone and Telegraph Communications
27	Radio and Television Communications
29	Other Utilities

Code	Description
3	Transportation
30	Railroad
31	Rail Rapid Transit
32	Bus and Streetcar
33	Taxi
34	Motor Freight Transportation
35	Street and Highway Rights of Way
36	Automobile Parking
37	Air
38	Marine
39	Other Transportation
4	Consumer Services
40	Stores
41	Shopping Centers
42	Gas Stations, Auto Repair, Automobile Dealers and Auto and Truck Rentals
43	Repair Services (not auto repair)
44	Personal Services
45	Eating and Drinking
46	Medical and Dental Clinics, Centers, and Laboratory Services
49	Other Consumer Services
5	Offices
51	Commercial Offices
52	Professional and Trade Associations
53	Institutional Offices

Code	Description
54	Federal Government Offices
55	State and Local Government Offices
56	Foreign Governments and International Organizations including embassies, chanceries, etc.
59	Other Offices
6	Public Services
60	Cemeteries
61	Hospitals
62	Nursing Homes
63	Other Health Facilities (except Clinics)
64	Police Stations
65	Fire and Rescue Stations
66	Correctional Institutions
67	Military Installations
68	Welfare and Charitable Services
69	Other Public Services
7	Cultural, Educational and Entertainment Services
70	Churches, Synagogues, and other places of worship
71	Civic, social and fraternal associations
72	Libraries
73	Permanent exhibitions, including museums, art galleries, monuments, planeteria, aquariums, and urban historic sites
74	Places of public assembly, including theaters, stadiums, auditoriums and exhibition halls
75	Nursery Schools

Code	Description
76	Elementary Schools
77	Secondary Schools
78	Colleges and Universities
79	Commercial Schools
8	Parks and Recreation
80	Indoor recreation, including recreation centers, indoor swimming, gymnasiums, ice and roller skating rinks, bowling, and penny arcades
81	Outdoor Amusements, including fairgrounds, race tracks, go-cart tracks, miniature golf, golf driving ranges, and amusement parks
82	Private outdoor Recreation, including tennis, swimming, country clubs, and yachting clubs, limited to members and guests
83	Commercial Outdoor recreation, including resorts, riding academies, ski runs, organized camps, and marinas
84	Public Golf Courses
85	Play lots, playgrounds and playfields
86	Parks- leisure and ornamental
87	Parks- General recreation, including individual camping and picnicing as well as areas for the preservation and enjoyment of nature, including zoos, botanical gardens, arboretums and national parks
88	Outdoor Courts and pools open to the public (tennis, basketball, swimming, etc.)
89	Other Parks
9	Resource Uses and Undeveloped Areas
90	Agriculture
91	Agriculture Related Activities

Code	Description
92	Forestry Activities and Related Services
93	Mining Activities and Related Services
94	Permanent Conservation Areas
95	Other Resource Production and Extraction
96	Undeveloped and Unused Land Area
97	Water Areas
98	Vacant Floor Area
99	Under Construction

Code No. 2-Ownership

Code	Description
Private	
100	Individual
110	Condominium
120	Cooperative
130	Partnership
140	Corporation, Profit
150	Corporation, Limited Dividend
160	Corporation, Non-Profit
170	Unicorp Organization
180	Trust
190	Other or unknown type of private ownership
County	
200	Tippecanoe

Code	Description
Townships	
310	Tippecanoe
320	Washington
321	Penny
322	Fairfield
323	Sheffield
324	Lauramie
325	Randolph
326	Jackson
327	Wayne
328	Union
329	Wea
330	Wabash
331	Shelby
Municipalities	
410	Lafayette
420	West Lafayette
430	Colburn
431	Americus
432	Battle Ground
433	Montmorenci
434	Buck Creek
435	Monitor
436	Pettit
437	Shadeland

Code	Description
438	Dayton
439	West Point
440	Odell
441	Concord
442	Stockwell
443	Monroe
444	Clarks Hill
445	Romney
446	Otterbein

Special Districts

510 School Board

520 School Board

etc.

State Government

610 Indiana

611 Purdue

Federal Government

710 United States

Code No. 3-Easement Code

Code	Description
1	Scenic Easement
2	Utility
3	For Recreational Trails or Access to Recreation

Code	Description
9	Other Easements

Code No. 4-Landmark Code

Code	Description
1	Historical Significance
2	Unusual Architectural Merit
3	Both

Code No. 5-Neighborhood Characteristics

Code	Description
4	Less than 10% blight
3	10-20% blight
2	20-50% blight
1	Greater than 50% of neighborhood blighted

Code No. 6-Land Appearance

Code	Description
9	Well landscaped, no maintenance required
7	Good landscaping, some maintenance and/or clean-up needed
5	Fair landscaping, considerable maintenance and/or clean-up needed
3	Poor or no landscaping, extensive maintenance, clean-up and grading needed to improve the land

Code No. 7-Zoning Code

Code	Description
1	Agriculture "A"
2	Glood Plain Districts FP
3	Forestry Conservation Districts FC
4	Residential Low Density RI
5	Residential Medium Density RIA
6	Residential High Density RIB
7	Residential Medium and 2 Family R2
8	Residential Multiple Family R3
9	Residential All Types R4
10	Accommodations Business AB
11	Local Business LB
12	Local Business Filling St. LBS
13	General Business GB
14	Central Business CB
15	Shopping Center SC
16	Industrial Districts I
17	Industrial Reserve Aid IR

Code No. 8-Comprehensive Plan Use Code

Code	Description
01	Agricultural
02	Low Density Residential
03	Medium Density Residential
04	High Density Residential

Code	Description
05	Commercial, (CBD and Neighborhood Shopping Districts)
06	Industrial (Mfg., Reserve)
07	Industrial Research
08	Public and Quasi Public (Schools, Parks, Recreation and Other)
09	Purdue
10	Flood Plain
11	Wildcat Reservoirs

Code No. 9-Water System Code

Code	Description
1	Public Water System
2	Private Water System
9	No Water System

Note: Definition of water system is water provided from an off parcel source.

Code No. 10-Sewer System Code

Code	Description
1	Private Sanitary Sewer System, no Storm Sewer
2	Private Sanitary Sewer System, and Storm Sewer
3	Public Sanitary Sewer System, No Storm Sewer
4	Public Sanitary Sewer System, and Storm Sewer Separate
5	Public Sanitary Sewer and Storm Sewer, Combined
9	No Sanitary or Storm Sewer System.

Note: A private system is defined as one owned and operated by any persion, group or corporation other than a city, municipal, county, state or federal government.

Code No. 11-Functional Street Class Code

Code	Description
1	Local, Two Way
2	Collector, Two Way
3	Minor Arterial, Two Way
4	Major Arterial, Two Way
5	Expressway
6	Local, One Way
7	Collector, One Way
8	Minor Arterial, One Way
9	Major Arterial, One Way

Code No. 12-Structural Composition

Code	Description
1	Gravel
2	Asphalt, Soil Cement Base
3	Concrete, < 8" Thick
4	Concrete, ≥ 8" Thick
5	Asphalt, Brick Base
6	Asphalt, Concrete Base
7	Asphalt, Sand and Gravel Base
8	Brick
9	Asphalt, No Formal Base

Code No. 13-Traffic Control Signs and Signal Codes

Code	Description
1	Stop Sign
2	Yield Sign
3	Traffic Light (red, yellow, green)
4	No Right Turn
5	No Left Turn
6	No Turns
7	One Way
8	Parking Regulations Sign
9	Traffic Light, Flashing Blinker
0	Route Signs

Code No. 14-Curb Parking Regulations Code

Code	Description
1	No Parking
2	Parking 1/2 Hour or Less
3	Parking 2 Hours or Less
4	Parking No Restrictions
5	Bus or Taxi Stop
6	Fire Zone
7	Parking Metered, Less than 1/2 Hour
8	Parking Metered, Longer than 1/2 Hour
9	No Parking, Standing or Stopping

Code No. 15-Curb Type Code

Code	Description
1	Concrete Sloping Mountable Curb
2	Concrete Rectangular Mountable Curb (less than 5" high)
3	Concrete Rectangular Barrier Curb (greater than 5" high)
4	Asphaltic Curb
9	No Curb

Code No. 16-Sidewalk Code

Code	Description
1	Commercial Sidewalk One Side, No Sidewalk Other Side
2	Commercial Sidewalk One Side, Residential Sidewalk Other Side
3	Commerical Sidewalk, Both Sides
4	Residential Sidewalk One Side, No Sidewalk Other Side
5	Residential Sidewalk Both Sides
9	No Sidewalks Either Side

Note: A commercial sidewalk is defined as greater than six feet in width.

Code No. 17-Access Control

Code	Description
1	Partial Control of Access
2	Full Control of Access
9	No Access Control

Code No. 18-Roadway Condition Code

Code	Description
9	Very Good Condition, Little or No Maintenance Required
7	Good Condition Some Light Maintenance Required
5	Fair Condition, Considerable Maintenace Required
3	Poor Condition, Extensive Maintenance Required
1	Very Poor Condition, Reconstruction and/or Resurfacing Necessary

Code No. 19-Foundation Construction Code

Code	Description
1	Concrete
2	Stone
3	Brick
4	Concrete Block
5	Piers

Code No. 20-Frame Construction Code

Code	Description
1	Wood Frame
2	Brick
3	Stone
4	Concrete
5	Aluminum
6	Metal, Steel Sklt., Joist

Code No. 21-Siding Code

Code	Description
1	Common Brick, Face Brick, Glazed Tile, Tile, Stone
2	Concrete
3	Stucco
4	Aluminum Siding
5	Siding, Shingles, Other Than Wood or Aluminum
6	Wood Siding, Shingles
7	Metal
8	Glass
9	Concrete Block

Code No. 22-Roof Code

Code	Description
1	Composition
2	Asphalt Shingle
3	Metal
4	Slate
5	Tile
6	Tin
7	Tar and Gravel
8	Wood Shingles
9	Rolled Roofing

Code No. 23-Type of Structure Code

Code	Description
10	Detached Building (free standing)
11	Attached Building (at least one wall in common with another building)
20	Poles
21	Lines, Power, Telephone, Telegraph
22	Tower
23	Pipelines
24	Tank
31	Piers, Wharf
31	Trestle
40	Fence
41	Wall
42	Signs, Billboards, and Other Outdoor Advertising Structures
50	Platform
51	Drying Bed
52	Swimming Pool
60	Arcade
70	Pavement
80	Open Structure (Spectator Stands, Outdoor Theatres, storage)
90	Other Structures, N.E.C.

Code No. 24-Building Condition Code

Code	Description
9	New Building, No Maintenance Required
7	Good Building, Minor Maintenance Needed
5	Fair Building, Some Maintenace Needed
3	Poor Building, Extensive Maintenance Needed
1	Dilapidated Building, Reconstruction May Be Warranted

Code No. 25-Type of Building Code Violation

Code Description

Not available at present time due to small amount of information available.

Code No. 26-Space Use Code

Code Description

See Standard Land Use Coding Manual by HHFA and BPR.

Use the four (4) digit code.

Note: Instead of Code 6813 representing secondary schools let Code 6813 represent junior high schools, let Code 6814 represent senior high schools.

Code No. 27-Type of Communicable Disease

Code	Description
01	Amebiasis
02	Aseptic Meningitis
03	Brucellosis
04	Chickenpox

Code	Description
05	Diphtheria
06	Dysentery, Bacillary
07	Dysentery, Unspecified (Amebic)
08	Encephalitis
09	Helminthic Infestations
10	Impetigo
11	Infectious Hepatitis
12	Influenza
13	Measles (Rubeola)
14	Meningococcic Infections
15	Meningitis, Other
16	Mumps (Infectious Parotitis)
17	Pertussis
18	Pneumonia
19	Rabies in Animals
20	Rheumatic Fever
21	Rebella (German Measles)
22	Salmonellosis, Other Than Typhoid
23	Scarlet Fever
24	Streptococcic Sore Throat
25	Tinea Capitis (Ringworm of the Scalp)
26	Tularemia
27	Typhoid Fever
28	Anthrax
29	Botulism

Code	Description
30	Cholera
31	Conjunctivitis (Pink-eye)
32	Eastern Equine Encephalomyelitis
33	Gonococcal Ophthalmia
34	Gonococcal Ophthalmia Prophylaxis
35	Histoplasmosis
36	Infectious Jaundice
37	Infectious Mononucleosis
38	Malaria
39	Meningococcemia
40	Influenzak
41	Pneumococcal
42	Streptococcal
43	Syphilitic
44	Tuberculosis
45	Viral (Aseptic)
46	Meningococcic Meningitis
47	Ophthalmia Neonatorum
48	Gonococcal
49	Pediculosis (Lousiness)
50	Pertussis (Whooping Cough)
51	Poliomyelitis
52	Prophylaxis Ophthalmia Neonatorum
53	Psittacois
54	Q Fever

Code	Description
55	Rheumatic Fever
56	Rocky Mountain Spotted Fever
57	Scabies
58	Silver Nitrate Prophylaxis, Ophthalmia Neonatorum
59	Smallpox
60	Tetanus
61	Trachoma
62	Trichinosis
63	Tularemia
64	Typhoid Fever
65	Typhoid (Endemic[flea-borne] and Epidemic[louse-borne])
66	Venereal Disease
67	Western Equine Encephalomyelitis
68	Syphilis
69	Granuloma Inguinale
70	Gonorrhea
71	Lymphopathia Venereum
72	Chancoid
73	Ophthalmia Neonatorum (of gonococcal etiology)
74	Erysipelas
75	Yellow Fever
76	Lymphocytic choriomeningitis
77	Animal Bites

Code No. 28-Street Type

Code	Description
ST	Street
LN	Lane
BLV	Boulevard
PTH	Path
AVE	Avenue
DR	Drive
CT	Court
RD	Road
TR	Trail
CR	Circle
TER	Terrace
PL	Place

Note: A north, south, east or west designation is coded by preceding the street name by an N, S, E or W respectively; followed by one blank space.

Code No. 29-Transaction Code

Code	Description
1	First piece of data on card has been changed
2	Second piece of data on card has been changed
3	Third piece of data on card has been changed
4	Etc.
98	General, but incomplete, update. More than one piece of data has been changed but not all data has been examined for its present accuracy
99	General update, all data on the card has been made current

APPENDIX III

APPENDIX III

PROGRAM DESCRIPTION AND LISTING

Program 1: Initialize the Parcel Number - Grid Coordinate-Address File

This program reads the data cards for this file and places the data on tape. The tape to be used must be specified in the control cards for the program. Once this program has been used to initialize the file, any operation can be performed on the data. Sample data follow the main body of the program.

PROGRAM 1

INITIALIZE PARCEL NUMBER - GRID COORDINATE - ADDRESS FILE

```
3484,MAXMAN.
REQUEST(TAPE3,HI,N). MOUNT CSC TAPE 775. RING(IN).
RUN(S).
LGO.
'
      PROGRAM COOR(INPUT,OUTPUT,
     1      TAPE5=INPUT,TAPE6=OUTPUT,TAPE3)
      INTEGER PNO,XCOORD,YCOORD
      DIMENSION ADDRES(9)
    5 READ(5,6)PNO,XCOORD,YCOORD,ADDRES
    6 FORMAT (I6,1X,I6,1X,I6,1X,8A6,A3)
      IF(PNO.EQ. 0) GO TO 99
      WRITE(3,6)PNO,XCOORD,YCOORD,ADDRES
      WRITE (6,7)PNO,XCOORD,YCOORD,ADDRES
    7 FORMAT (5X,I6,1X,I6,1X,I6,1X,8A6,A3)
      GO TO 5
   99 CONTINUE
      END FILE 3
      REWIND 3
      END
'
   999(444444,555555)987654 TODD                                              LN
666555(777777,   888)   777 JENNIFER                                          BLV
   119(111111,222222)   111 EAST LOW                                          ST

'
```

Program 2: Read more information for the Parcel Number-Grid Coordinate-Address File

This program reads data cards and adds this information to an existing Parcel Number-Grid Coordinate-Address File. This program can be used as more parcels are digitized; it eliminates the necessity of initializing the entire file at one time. Sample data follow the main body of the program. The tape used for the file must be noted on the program control cards.

PROGRAM 2

READ MORE INFORMATION FOR PARCEL NUMBER -GRID COORDINATE - ADDRESS FILE

```
3484,MAXMAN.
REQUEST (TAPE3,HI,E). MOUNT CSC TAPE 774. RING(IN).
RUN(S).
LGO.
'
      PROGRAM COOR(INPUT,OUTPUT,
     1      TAPE5=INPUT,TAPE6=OUTPUT,TAPE3)
      INTEGER PNO,XCOORD,YCOORD
      DIMENSION ADDRES(9)
    5 READ(3,6)PNO,XCOORD,YCOORD,ADDRES
    6 FORMAT (I6,1X,I6,1X,I6,1X,8A6,A3)
      IF(EOF,3) 99,5
   99 CONTINUE
      BACKSPACE 3
   50 READ(5,6)PNO,XCOORD,YCOORD,ADDRES
      IF (PNO.EQ.0) GO TO 199
      WRITE(3,6)PNO,XCOORD,YCOORD,ADDRES
      WRITE (6,7)PNO,XCOORD,YCOORD,ADDRES
    7 FORMAT (5X,I6,1X,I6,1X,I6,1X,8A6,A3)
      GO TO 50
  199 CONTINUE
      END FILE 3
      REWIND 3
      END
'
   999(444444,555555)987654 TODD                                     LN
666555(777777,   888)   777 JENNIFER                                 BLV
   119(111111,222222)   111 EAST LOW                                 ST

'
```

Program 3: Initialize the General Data File

This program reads data cards for the General Data File and then writes this information on tape. The tape number must be specified in the control cards for the program. After the information has been put on tape by this program, the data are ready to be utilized by the other programs. Sample data follow the main body of the program.

PROGRAM 3

INITIALIZE GENERAL DATA FILE

```
3484,MAXMAN,CM70000.
REQUEST(TAPE1,HI,N).MOUNT CSC TAPE 774. RING(IN).
RUN(S),
LGO.
'
      PROGRAM MAIN(INPUT,OUTPUT,
     1       TAPE5=INPUT,TAPE6=OUTPUT,TAPE1)
      INTEGER PNO,CRDTYP,CHANGE,TRANCD,DATA,OPNO,OLUSE,NULUSE,OWNER,
     1YRSUB,EASEMT,LNDMK,NEIGH,NOSTRUT,OLZON,NUZON,ZONREQ,ZONVAR,
     2COMUSE,FLAG,WATER,SEWER,ELECT,GASS,WELL,SEPTIC,EMPARK,CUPARK,
     3RESPK,COMPK,SALEDT,GLARE,HEAT,VIBR,SMELL,GAS,RADIAT,NOISE,FLINT,
     4SMOKE,OLBLDG,NUBLDG,YRBLT,FND,FRAME,SIDING,ROOF,STRTYP,BLDCON,
     5OLSUSE,NUSUSE,TOTEMP,PEAKEM,OPTEMP,NOROOM,MOT5,M6T18,M19T25,
     6YRPRMT,NOFLR,BASMNT,NODU,VIOL,NOVIOL,NOEST,BLDKEY,OLOC,NULOC,
     7M26T64,MGT64,F0T5,F6T18,F19T25,F26T62,FGT62,F14T44,VEHOWN,POLCAL,
     8FIRECAL,WELFAR,NODIS,DISEAS,INTER, FUNCLS,STRCOM,GRADE,ACCID,
     9TRCONT,SPDLMT,NEPKG,SWPKG,CRBTYP,SIDWLK,NOLANE,LOAD,BUSRT,SCHRT,
     1ACCESS,COND,PRIZON,SECZON,TERZON,MNCOMP,SCCOMP,TDCOMP,MNLUSE,
     2SCLUSE,TDLUSE,LND,YRCH
      REAL FRONT,AREA,ASVAL,LDAREA,VALIMP,TOTVAL,SALEPR,COSTPR,TOTARE,
     1ESTARE,SETBK,REQBK,RECOST,INCOME,RENT,LENGTH,ROWID,PAVWID,ADT
      DIMENSION DATA(7)
    5 READ (5,6) PNO,CRDTYP,CHANGE,TRANCD,DATA
    6 FORMAT (I6,I2,I4,I2,6A10,A6)
      IF ( CRDTYP .EQ. 1) GO TO 3
      IF (CRDTYP .EQ. 2) GO TO 17
      IF ( CRDTYP .EQ. 3) GO TO 27
      IF (CRDTYP .EQ. 4) GO TO 37
      IF (CRDTYP .EQ. 12) GO TO 47
      IF (CRDTYP .EQ. 11) GO TO 57
      IF(CRDTYP.EQ.99)GO TO 99
      GO TO 67
    3 CONTINUE
    7 DECODE(66,8,DATA)OLPNO,OLUSE,NULUSE,OWNER,FRONT,AREA,YRSUB,ASVAL
     1,EASEMT,LNDMK,NEIGH,LND,NOSTRT,YRCH,OLZON,NUZON,ZONREQ,ZONVAR,
     2COMUSE,FLAG,WATER,SEWER,ELECT,GASS,WELL,SEPTIC
    8 FORMAT (I6,I4,I4,I3,F4.0,F6.0,I3,F5.0,4I1,4I2,I4,
     1I4,I2,7I1)
      WRITE (1,9)PNO,CRDTYP,CHANGE,TRANCD,OLPNO,OLUSE,NULUSE,OWNER,FRONT
     *,AREA,YRSUB,ASVAL
     1,EASEMT,LNDMK,NEIGH,LND,NOSTRT,YRCH,OLZON,NUZON,ZONREQ,ZONVAR,
     2COMUSE,FLAG,WATER,SEWER,ELECT,GASS,WELL,SEPTIC
    9 FORMAT (I6,I2,I4,I2,I6,2I4,I3,F4.0,F6.0,I3,F5.0,4I1,4I2,I4,I4,I2,
     17I1)
      WRITE(6,10)PNO,CRDTYP,CHANGE,TRANCD,OLPNO,OLUSE,NULUSE,OWNER,FRONT
     *,AREA,YRSUB,ASVAL
     1,EASEMT,LNDMK,NEIGH,LND,NOSTRT,YRCH,OLZON,NUZON,ZONREQ,ZONVAR,
     2COMUSE,FLAG,WATER,SEWER,ELECT,GASS,WELL,SEPTIC
   10 FORMAT (5X,I6,I2,I4,I2,I6,2I4,I3,F4.0,F6.0,I3,F5.0,4I1,4I2,I4,I4,
```

PROGRAM 3, CONTINUED

```
  1I2,7I1)
   GO TO 5
17 DECODE(66,18,DATA)EMPARK,CUPARK,RESPK,COMPK,LDAREA,VALIMP,
  1TOTVAL,SALEDT,SALEPR,GLARE,HEAT,VIBR,SMELL,GAS,RADIAT,NOISE,
  2ELINT,SMOKE
18 FORMAT (4I4,F3.0,2F5.0,I2,F5.0,9I1)
   WRITE (1,19)PNO,CRDTYP,CHANGE,TRANCD,EMPARK,CUPARK,RESPK,COMPK,
  *LDAREA,VALIMP,
  1TOTVAL,SALEDT,SALEPR,GLARE,HEAT,VIBR,SMELL,GAS,RADIAT,NOISE,
  2ELINT,SMOKE
19 FORMAT (I6,I2,I4,I2,4I4,F3.0,2F5.0,I2,F5.0,9I1)
   WRITE (6,20)PNO,CRDTYP,CHANGE,TRANCD,EMPARK,CUPARK,RESPK,COMPK,
  *LDAREA,VALIMP,
  1TOTVAL,SALEDT,SALEPR,GLARE,HEAT,VIBR,SMELL,GAS,RADIAT,NOISE,
  2ELINT,SMOKE
20 FORMAT (5X,I6,I2,I4,I2,4I4,F3.0,2F5.0,I2,F5.0,9I1)
   GO TO 5
27 DECODE(66,28,DATA)OLBLDG,NUBLDG,YRBLT,FND,FRAME,SIDING,ROOF,
  1STRTYP,BLDCON,YRPRMT,COSTPR,NOFLR,TOTARE,BASMNT,FSTARE,NODU,
  2SETBK,REQBK,RECOST,VIOL,NCVIOL,NOEST
28 FORMAT (2I2,I3,4I1,I2,I1,I2,F6.0,I2,F7.0,I1,F6.0,I3,3F3.0,I1,2I2)
   WRITE (1,29)PNO,CRDTYP,CHANGE,TRANCD,OLBLDG,NUBLDG,YRBLT,FND,FRAME
  *,SIDING,ROOF,
  1STRTYP,BLDCON,YRPRMT,COSTPR,NOFLR,TOTARE,BASMNT,FSTARE,NODU,
  2SETBK,REQBK,RECOST,VIOL,NOVIOL,NOEST
29 FORMAT (I6,I2,I4,I2,2I2,I3,4I1,I2,I1,I2,F6.0,I2,F7.0,I1,F6.0,I3,
  *3F3.0,I1,2I2)
   WRITE (6,30)PNO,CRDTYP,CHANGE,TRANCD,OLBLDG,NUBLDG,YRBLT,FND,FRAME
  *,SIDING,ROOF,
  1STRTYP,BLDCON,YRPRMT,COSTPR,NOFLR,TOTARE,BASMNT,FSTARE,NODU,
  2SETBK,REQBK,RECOST,VIOL,NOVIOL,NOEST
30 FORMAT (5X,I6,I2,I4,I2,2I2,I3,4I1,I2,I1,I2,F6.0,I2,F7.0,I1,F6.0,I3
  *,3F3.0,I1,2I2)
   GO TO 5
37 DECODE(66,38,DATA)BLDKEY,OLOC,NULOC,OLSUSE,NUSUSE,TOTEMP,
  1PEAKEM ,OPTEMP,NOROOM,MOT5,M6T18,M19T25,M26T64,MGT64,FOT5,F6T18,
  2F19T25,F26T62,FGT62,F14T44,INCOME,VEHOWN,POLCAL,FIRECAL,WELFAR,
  3NODIS,DISEAS,RENT
38 FORMAT (3I2,5I4,12I2,F3.0,3I2,2I1,I2,F3.0)
   WRITE (1,39)PNO,CRDTYP,CHANGE,TRANCD,BLDKEY,OLOC,NULOC,OLSUSE,
  *NUSUSE,TOTEMP,
  1PEAKEM ,OPTEMP,NOROOM,MOT5,M6T18,M19T25,M26T64,MGT64,FOT5,F6T18,
  2F19T25,F26T62,FGT62,F14T44,INCOME,VEHOWN,POLCAL,FIRECAL,WELFAR,
  3NODIS,DISEAS,RENT
39 FORMAT (I6,I2,I4,I2,3I2,5I4,12I2,F3.0,3I2,2I1,I2,F3.0)
   WRITE (6,40)PNO,CRDTYP,CHANGE,TRANCD,BLDKEY,OLOC,NULOC,OLSUSE,
  *NUSUSE,TOTEMP,
  1PEAKEM ,OPTEMP,NOROOM,MOT5,M6T18,M19T25,M26T64,MGT64,FOT5,F6T18,
  2F19T25,F26T62,FGT62,F14T44,INCOME,VEHOWN,POLCAL,FIRECAL,WELFAR,
  3NODIS,DISEAS,RENT
40 FORMAT (5X,I6,I2,I4,I2,3I2,5I4,12I2,F3.0,3I2,2I1,I2,F3.0)
   GO TO 5
```

PROGRAM 3, CONTINUED

```
47 DECODE(66,48,DATA)INTER,LENGTH,ROWID,PAVWID,FUNCLS,STRCOM,GRADE,
  1ADT,ACCID,TRCONT,SPDLMT,NEPKG,SWPKG,CRBTYP,SIDWLK,NOLANE,LOAD,
  2BUSRT,SCHRT,ACCESS,COND
48 FORMAT (I1,F4.0,2F3.0,3I1,F5.0,I2,I4,I2,10I1)
   WRITE (1,49)PNO,CRDTYP,CHANGE,TRANCD,INTER,LENGTH,ROWID,PAVWID,
  *FUNCLS,STRCOM,GRADE,
  1ADT,ACCID,TRCONT,SPDLMT,NEPKG,SWPKG,CRBTYP,SIDWLK,NOLANE,LOAD,
  2BUSRT,SCHRT,ACCESS,COND
49 FORMAT (I6,I2,I4,I2,I1,F4.0,2F3.0,3I1,F5.0,I2,I4,I2,10I1)
   WRITE (6,50)PNO,CRDTYP,CHANGE,TRANCD,INTER,LENGTH,ROWID,PAVWID,
  *FUNCLS,STRCOM,GRADE,
  1ADT,ACCID,TRCONT,SPDLMT,NEPKG,SWPKG,CRBTYP,SIDWLK,NOLANE,LOAD,
  2BUSRT,SCHRT,ACCESS,COND
50 FORMAT (5X,I6,I2,I4,I2,I1,F4.0,2F3.0,3I1,F5.0,I2,I4,I2,10I1)
   GO TO 5
57 DECODE(66,58,DATA)PRIZON,SECZON,TERZON,MNCOMP,SCCOMP,TDCOMP,
  1MNLUSE,SCLUSE,TDLUSE
58 FORMAT(6I2,3I4)
   WRITE (1,59)PNO,CRDTYP,CHANGE,TRANCD,PRIZON,SECZON,TERZON,MNCOMP,
  *SCCOMP,TDCOMP,
  1MNLUSE,SCLUSE,TDLUSE
59 FORMAT (I6,I2,I4,I2,6I2,3I4)
   WRITE (6,60)PNO,CRDTYP,CHANGE,TRANCD,PRIZON,SECZON,TERZON,MNCOMP,
  *SCCOMP,TDCOMP,
  1MNLUSE,SCLUSE,TDLUSE
60 FORMAT (5X,I6,I2,I4,I2,6I2,3I4)
   GO TO 5
67 WRITE (6,68)PNO
68 FORMAT (11H PARCEL NO ,I6,41H HAS A DATA CARD WITH AN INCORRECT NU
  1MBER)
   GO TO 5
99 CONTINUE
   END FILE 1
   REWIND 1
   END

 15010000000000000000001100123456789012345678901234567890123456789012345678901234567890
 15020000000000000000258888123456789012345678901234567890123456789012345678901234567890
 11010000000000000000001100123456789012345678901234567890123456789012345678901234567890
   99
```

Program 4: Read more information for the General Data File

This program reads data cards and adds the information to the existing General Data File. This program can be used as information is assembled for additional parcels. This enables the General Data File to be initialized in stages so that the data file can be checked as initialization takes place. Sample data follow the main body of the program. The tape used for the file must be noted on the program control cards.

PROGRAM 4

READ MORE INFORMATION FOR GENERAL DATA FILE

```
3484,MAXMAN,CM70000.
REQUEST(TAPEI,HI,N).MOUNT CSC TAPE 776.   RING(IN).
RUN(S).
LGO.
'
      PROGRAM MAIN(INPUT,OUTPUT,
     1        TAPE5=INPUT,TAPE6=OUTPUT,TAPEI)
      INTEGER PNO,CRDTYP,CHANGE,TRANCD,DATA,OPNO,OLUSE,NULUSE,OWNER,
     1YRSUB,EASEMT,LNDMK,NEIGH,NOSTRUT,OLZON,NUZON,ZONREQ,ZONVAR,
     2COMUSE,FLAG,WATER,SEWER,ELECT,GASS,WELL,SEPTIC,EMPARK,CUPARK,
     3PESPK,COMPK,SALEDT,GLARE,HEAT,VIBR,SMELL,GAS,RADIAT,NOISE,ELINT,
     4SMOKE,OLBLDG,NUBLDG,YRBLT,FND,FRAME,SIDING,ROOF,STRTYP,BLDCON,
     5OLSUSE,NUSUSE,TOTEMP,PEAKEM,OPTEMP,NOROOM,MOT5,M6T18,M19T25,
     6YRPRMT,NOFLR,BASMNT,NODU,VIOL,NOVIOL,NOEST,BLDKEY,OLOC,NULOC,
     7M26T64,MGT64,FOT5,F6T18,F19T25,F26T62,FGT62,F14T44,VEHOWN,POLCAL,
     8FIRECAL,WELFAR,NODIS,DISEAS,INTER, FUNCLS,STRCOM,GRADE,ACCID,
     9TRCONT,SPDLMT,NEPKG,SWPKG,CRBTYP,SIDWLK,NOLANE,LOAD,BUSRT,SCHRT,
     1ACCESS,COND,PRIZON,SECZON,TERZON,MNCOMP,SCCOMP,TDCOMP,MNLUSE,
     2SCLUSE,TDLUSE,LND,YRCH
      REAL FRONT,AREA,ASVAL,LDAREA,VALIMP,TOTVAL,SALEPR,COSTPR,TOTARE,
     IFSTARE,SETBK,REQBK,RECOST,INCOME,RENT,LENGTH,ROWID,PAVWID,ADT
      DIMENSION DATA(7)
    4 READ(I,1I) PNO
   1I FORMAT(I6)
      IF(EOF,1)I2,4
   I2 CONTINUE
      BACKSPACE I
    5 READ (5,6) PNO,CRDTYP,CHANGE,TRANCO,DATA
    6 FORMAT (I6,I2,I4,I2,6A10,A6)
      IF ( CRDTYP .EQ. I) GO TO 3
      IF (CRDTYP .EQ. 2) GO TO 17
      IF ( CRDTYP .EQ. 3) GO TO 27
      IF (CRDTYP .EQ. 4) GO TO 37
      IF (CRDTYP .EQ. 12) GO TO 47
      IF (CRDTYP .EQ. 1I) GO TO 57
      IF(CRDTYP.EQ.99)GO TO 99
      GO TO 67
    3 CONTINUE
    7 DECODE(66,8,DATA)OLPNO,OLUSE,NULUSE,OWNER,FRONT,AREA,YRSUB,ASVAL
     I,EASEMT,LNDMK,NEIGH,LND,NOSTRT,YRCH,OLZON,NUZON,ZONREO,ZONVAR,
     2COMUSE,FLAG,WATER,SEWER,ELECT,GASS,WELL,SEPTIC
    8 FORMAT (I6,I4,I4,I3,F4.0,F6.0,I3,F5.0,4I1,4I2,I4,
     1I4,I2,7I1)
      WRITE (I,9)PNO,CRDTYP,CHANGE,TRANCD,OLPNO,OLUSE,NULUSE,OWNER,FRONT
     *,AREA,YRSUB,ASVAL
     I,EASEMT,LNDMK,NEIGH,LND,NOSTRT,YRCH,OLZON,NUZON,ZONREO,ZONVAR,
     2COMUSE,FLAG,WATER,SEWER,ELECT,GASS,WELL,SEPTIC
    9 FORMAT (I6,I2,I4,I2,I6,2I4,I3,F4.0,F6.0,I3,F5.0,4I1,4I2,I4,I4,I2,
     17I1)
```

PROGRAM 4, CONTINUED

```
  1PEAKEM ,OPTEMP,NOROOM,MOT5,M6T18,M19T25,M26T64,MGT64,FOT5,F6T18,
  2F19T25,F26T62,FGT62,F14T44,INCOME,VEHOWN,POLCAL,FIRECAL,WELFAR,
  3NODIS,DISEAS,RENT
 40 FORMAT (5X,I6,I2,I4,I2,3I2,5I4,12I2,F3.0,3I2,2I1,I2,F3.0)
    GO TO 5
 47 DECODE(66,48,DATA)INTER,LENGTH,ROWID,PAVWID,FUNCLS,STRCOM,GRADE,
  1ADT,ACCID,TRCONT,SPDLMT,NEPKG,SWPKG,CRBTYP,SIDWLK,NOLANE,LOAD,
  2BUSRT,SCHRT,ACCESS,COND
 48 FORMAT (I1,F4.0,2F3.0,3I1,F5.0,I2,I4,I2,10I1)
    WRITE (1,49)PNO,CRDTYP,CHANGE,TRANCD,INTER,LENGTH,ROWID,PAVWID,
  *FUNCLS,STRCOM,GRADE,
  1ADT,ACCID,TRCONT,SPDLMT,NEPKG,SWPKG,CRBTYP,SIDWLK,NOLANE,LOAD,
  2BUSRT,SCHRT,ACCESS,COND
 49 FORMAT (I6,I2,I4,I2,I1,F4.0,2F3.0,3I1,F5.0,I2,I4,I2,10I1)
    WRITE (6,50)PNO,CRDTYP,CHANGE,TRANCD,INTER,LENGTH,ROWID,PAVWID,
  *FUNCLS,STRCOM,GRADE,
  1ADT,ACCID,TRCONT,SPDLMT,NEPKG,SWPKG,CRBTYP,SIDWLK,NOLANE,LOAD,
  2BUSRT,SCHRT,ACCESS,COND
 50 FORMAT (5X,I6,I2,I4,I2,I1,F4.0,2F3.0,3I1,F5.0,I2,I4,I2,10I1)
    GO TO 5
 57 DECODE(66,58,DATA)PRIZON,SECZON,TERZON,MNCOMP,SCCOMP,TDCOMP,
  1MNLUSE,SCLUSE,TDLUSE
 58 FORMAT(6I2,3I4)
    WRITE (1,59)PNO,CRDTYP,CHANGE,TRANCD,PRIZON,SECZON,TERZON,MNCOMP,
  *SCCOMP,TDCOMP,
  1MNLUSE,SCLUSE,TDLUSE
 59 FORMAT (I6,I2,I4,I2,6I2,3I4)
    WRITE (6,60)PNO,CRDTYP,CHANGE,TRANCD,PRIZON,SECZON,TERZON,MNCOMP,
  *SCCOMP,TDCOMP,
  1MNLUSE,SCLUSE,TDLUSE
 60 FORMAT (5X,I6,I2,I4,I2,6I2,3I4)
    GO TO 5
 67 WRITE (6,68)PNO
 68 FORMAT (11H PARCEL NO ,I6,41H HAS A DATA CARD WITH AN INCORRECT NU
  1MBER)
    GO TO 5
 99 CONTINUE
    END FILE 1
    REWIND 1
    END
'
00000101000000000000000000000100009000081096005431625431365432462200000454311OO
000001020123456789012345678901234567890123456789012345670OO
0000010401234567890123456789012345678901234567890123456700123456789012345678OO55
    99
'
```

Program 5: Initialize the Zone Name-Grid Coordinate File

This program reads the data cards for this file and writes the information on tape. The tape to be used must be specified on the control cards for the program. Once this program has been used to initialize the file, any operation can be performed on the data. Sample data follow the main body of the program.

PROGRAM 5

INITIALIZE ZONE NAME - GRID COORDINATE FILE

```
3484,MAXMAN.
REQUEST(TAPE2,HI,N). MOUNT CSC TAPE 774. RING(IN).
RUN(S).
LGO.
'
      PROGRAM ZON(INPUT,OUTPUT,
     1      TAPE5=INPUT,TAPE6=OUTPUT,TAPE2)
      INTEGER X(4),Y(4)
      DIMENSION ZON(4)
      REWIND 2
    5 READ(5,6)ZON,X(1),Y(1),X(2),Y(2),X(3),Y(3),X(4),Y(4)
    6 FORMAT (2A6,A2,A6,1X,I6,1X,I6,2X,I6,1X,I6,2X,I6,1X,I6,2X,I6,1X,I6)
      IF (X(1).EQ. 0) GO TO 99
      WRITE (2,6)ZON,X(1),Y(1),X(2),Y(2),X(3),Y(3),X(4),Y(4)
      WRITE (6,7)ZON,X(1),Y(1),X(2),Y(2),X(3),Y(3),X(4),Y(4)
    7 FORMAT (5X,2A6,A2,A6,1X,I6,1X,I6,2X,I6,1X,I6,2X,I6,1X,I6,2X,I6,1X,
     1I6)
      GO TO 5
   99 CONTINUE
      END FILE 2
      REWIND 2
      END
'
CENSUS TRACT  100456(111111,123456)(987654,666555)(555123,333215)(321568,362514)
CENSUS TRACT  123456(111111,123456)(987654,666555)(555123,333215)(321568,362514)
ZONE          111156(123987,654321)(666558,213456)(333256,251478)(235689,653247)

'
```

Program 6: Read more information for the Zone Name-Grid Coordinate File

This program reads data cards and adds the information to the existing Zone Name-Grid Coordinate File. This enables the file to be initialized in stages and more information added as the need becomes apparent. Sample data follow the main body of the program. The tape used for the file must be noted on the program control cards.

PROGRAM 6

READ MORE INFORMATION FOR ZONE NAME - GRID COORDINATE FILE

```
3484,MAXMAN.
REQUEST(TAPE2,HI,E). MOUNT CSC TAPE 775.RING(IN).
RUN(S).
LGO.
'
      PROGRAM ZON(INPUT,OUTPUT,
     1      TAPE5=INPUT,TAPE6=OUTPUT,TAPE2)
      INTEGER X(4),Y(4)
      DIMENSION ZON(4)
    5 READ(2,6)ZON,X(1),Y(1),X(2),Y(2),X(3),Y(3),X(4),Y(4)
    6 FORMAT (2A6,A2,A6,1X,I6,1X,I6,2X,I6,1X,I6,2X,I6,1X,I6,2X,I6,1X,I6)
      IF(EOF,2) 99,5
   99 CONTINUE
      BACKSPACE 2
   50 READ(5,6)ZON,X(1),Y(1),X(2),Y(2),X(3),Y(3),X(4),Y(4)
      IF(X(1).EQ.0)GO TO 199
      WRITE(2,6)ZON,X(1),Y(1),X(2),Y(2),X(3),Y(3),X(4),Y(4)
      WRITE(6,7)ZON,X(1),Y(1),X(2),Y(2),X(3),Y(3),X(4),Y(4)
    7 FORMAT (5X,2A6,A2,A6,1X,I6,1X,I6,2X,I6,1X,I6,2X,I6,1X,I6,2X,I6,1X,
     1I6)
      GO TO 50
  199 CONTINUE
      END FILE 2
      REWIND 2
      END
'
CENSUS TRACT    1234(     4,     4)(    16,     7)(    13,    12)(      4,     4)
CENSUS TRACT    1234(    16,     7)(    22,    19)(    13,    12)(     16,     7)
CENSUS TRACT    1234(     4,     4)(    13,    12)(     5,    20)(      4,     4)

'
```

Program 7: Read the Parcel Number-Grid Coordinate-Address File

This program reads the Parcel Number-Grid Coordinate-Address tape file and gives a complete printed listing of the file. The listing can be used to check the accuracy of the data and the completeness of the file. The tape used for the file must be noted on the program control cards.

PROGRAM 7

READ TAPE, PRINT COMPLETE LIST FOR PARCEL NUMBER - GRID COORDINATE - ADDRESS FILE

```
3484,MAXMAN.
REQUEST (TAPE3,HI,E). MOUNT CSC TAPE 774.  RING(OUT).
RUN(5).
LGO.
,
      PROGRAM COOR(INPUT,OUTPUT,
     1      TAPE5=INPUT,TAPE6=OUTPUT,TAPE3)
      INTEGER PNO,XCOORD,YCOORD
      DIMENSION ADDRES(9)
    5 READ(3,6)PNO,XCOORD,YCOORD,ADDRES
    6 FORMAT (I6,1X,I6,1X,I6,1X,8A6,A3)
      IF(EOF,3) 99,4
    4 WRITE (6,7)PNO,XCOORD,YCOORD,ADDRES
    7 FORMAT (5X,I6,1X,I6,1X,I6,1X,8A6,A3)
      GO TO 5
   99 CONTINUE
      REWIND 3
      END
,
```

Program 8: Read the General Data File

This program reads the General Data tape file and gives a complete printed listing of the file. The listing can be used to check the accuracy of the data and the completeness of the file. The tape used for the file must be noted on the program control cards.

PROGRAM 8

READ TAPE, PRINT COMPLETE LIST FOR GENERAL DATA FILE

```
3484,MAXMAN,CM70000.
REQUEST(TAPE1,HI,E).MOUNT CSC TAPE 622. THIS IS JHRP TAPE 28. RING(OUT).
RUN(S).
LGO.
,
       PROGRAM MAIN(INPUT,OUTPUT,
      1        TAPE5=INPUT,TAPE6=OUTPUT,TAPE1)
       INTEGER PNO,CRDTYP,CHANGE,TRANCD,DATA,OPNO,OLUSE,NULUSE,OWNER,
      1YRSUB,EASEMT,LNDMK,NEIGH,NOSTRUT,OLZON,NUZON,ZONREQ,ZONVAR,
      2COMUSE,FLAG,WATER,SEWER,ELECT,GASS,WELL,SEPTIC,EMPARK,CUPARK,
      3RESPK,COMPK,SALEDT,GLARE,HEAT,VIBR,SMELL,GAS,RADIAT,NOISE,ELINT,
      4SMOKE,OLBLDG,NUBLDG,YRBLT,FND,FRAME,SIDING,ROOF,STRTYP,BLDCON,
      5OLSUSE,NUSUSE,TOTEMP,PEAKEM,OPTEMP,NOROOM,MOT5,M6T18,M19T25,
      6YRPRMT,NOFLR,BASMNT,NODU,VIOL,NOVIOL,NOEST,BLDKEY,OLOC,NULOC,
      7M26T64,MGT64,FOT5,F6T18,F19T25,F26T62,FGT62,F14T44,VEHOWN,POLCAL,
      8FIRECAL,WELFAR,NODIS,DISEAS,INTER, FUNCLS,STRCOM,GRADE,ACCID,
      9TRCONT,SPDLMT,NEPKG,SWPKG,CRBTYP,SIDWLK,NOLANE,LOAD,BUSRT,SCHRT,
      1ACCESS,COND,PRIZON,SECZON,TERZON,MNCOMP,SCCOMP,TDCOMP,MNLUSE,
      2SCLUSE,TDLUSE,LND,YRCH
       REAL FRONT,AREA,ASVAL,LDAREA,VALIMP,TOTVAL,SALEPR,COSTPR,TOTARE,
      1FSTARE,SETBK,REQBK,RECOST,INCOME,RENT,LENGTH,ROWID,PAVWID,ADT
       DIMENSION DATA(7)
       REWIND 1
     5 READ(1,6)PNO,CRDTYP,CHANGE,TRANCD,DATA
     6 FORMAT (I6,I2,I4,I2,6A10,A6)
       IF(EOF,1) 99,4
     4 IF ( CRDTYP .EQ. 1) GO TO 3
       IF (CRDTYP .EQ. 2) GO TO 17
       IF ( CRDTYP .EQ. 3) GO TO 27
       IF (CRDTYP .EQ. 4) GO TO 37
       IF (CRDTYP .EQ. 12) GO TO 47
       IF (CRDTYP .EQ. 11) GO TO 57
       GO TO 67
     3 CONTINUE
     7 DECODE(66,8,DATA)OLPNO,OLUSE,NULUSE,OWNER,FRONT,AREA,YRSUB,ASVAL
      1,EASEMT,LNDMK,NEIGH,LND,NOSTRT,YRCH,OLZON,NUZON,ZONREQ,ZONVAR,
      2COMUSE,FLAG,WATER,SEWER,ELECT,GASS,WELL,SEPTIC
     8 FORMAT (I6,I4,I4,I3,F4.0,F6.0,I3,F5.0,4I1,4I2,I4,
      1I4,I2,7I1)
       WRITE(6,10)PNO,CRDTYP,CHANGE,TRANCD,OLPNO,OLUSE,NULUSE,OWNER,FRONT
      *,AREA,YRSUB,ASVAL
      1,EASEMT,LNDMK,NEIGH,LND,NOSTRT,YRCH,OLZON,NUZON,ZONREQ,ZONVAR,
      2COMUSE,FLAG,WATER,SEWER,ELECT,GASS,WELL,SEPTIC
    10 FORMAT (5X,I6,I2,I4,I2,I6,2I4,I3,F4.0,F6.0,I3,F5.0,4I1,4I2,I4,I4,
      1I2,7I1)
       GO TO 5
    17 DECODE(66,18,DATA)EMPARK,CUPARK,RESPK,COMPK,LDAREA,VALIMP,
      1TOTVAL,SALEDT,SALEPR,GLARE,HEAT,VIBR,SMELL,GAS,RADIAT,NOISE,
      2ELINT,SMOKE
    18 FORMAT (4I4,F3.0,2F5.0,I2,F5.0,9I1)
       WRITE (6,20)PNO,CRDTYP,CHANGE,TRANCD,EMPARK,CUPARK,RESPK,COMPK,
```

PROGRAM 8, CONTINUED

```
  *LDAREA,VALIMP,
  1TOTVAL,SALEDT,SALEPR,GLARE,HEAT,VIBR,SMELL,GAS,RADIAT,NOISE,
  2ELINT,SMOKE
20 FORMAT (5X,I6,I2,I4,I2,4I4,F3.0,2F5.0,I2,F5.0,9I1)
   GO TO 5
27 DECODE(66,28,DATA)OLBLDG,NUBLDG,YRBLT,FND,FRAME,SIDING,ROOF,
  1STRTYP,BLDCON,YRPRMT,COSTPR,NOFLR,TOTARE,BASMNT,FSTARE,NODU,
  2SETBK,REQBK,PECOST,VIOL,NOVIOL,NOEST
28 FORMAT (2I2,I3,4I1,I2,I1,I2,F6.0,I2,F7.0,I1,F6.0,I3,3F3.0,I1,2I2)
   WRITE (6,30)PNO,CRDTYP,CHANGE,TRANCD,OLBLDG,NUBLDG,YRBLT,FND,FRAME
  *,SIDING,ROOF,
  1STRTYP,BLDCON,YRPRMT,COSTPR,NOFLR,TOTARE,BASMNT,FSTARE,NODU,
  2SETBK,REQBK,PECOST,VIOL,NOVIOL,NOEST
30 FORMAT (5X,I6,I2,I4,I2,2I2,I3,4I1,I2,I1,I2,F6.0,I2,F7.0,I1,F6.0,I3
  *,3F3.0,I1,2I2)
   GO TO 5
37 DECODE(66,38,DATA)BLDKEY,OLOC,NULOC,OLSUSE,NUSUSE,TOTEMP,
  1PEAKEM ,OPTEMP,NOROOM,MOT5,M6T18,M19T25,M26T64,MGT64,FOT5,F6T18,
  2F19T25,F26T62,FGT62,F14T44,INCOME,VEHOWN,POLCAL,FIRECAL,WELFAR,
  3NODIS,DISEAS,RENT
38 FORMAT (3I2,5I4,12I2,F3.0,3I2,2I1,I2,F3.0)
   WRITE (6,40)PNO,CRDTYP,CHANGE,TRANCD,BLDKEY,OLOC,NULOC,OLSUSE,
  *NUSUSE,TOTEMP,
  1PEAKEM ,OPTEMP,NOROOM,MOT5,M6T18,M19T25,M26T64,MGT64,FOT5,F6T18,
  2F19T25,F26T62,FGT62,F14T44,INCOME,VEHOWN,POLCAL,FIRECAL,WELFAR,
  3NODIS,DISEAS,RENT
40 FORMAT (5X,I6,I2,I4,I2,3I2,5I4,12I2,F3.0,3I2,2I1,I2,F3.0)
   GO TO 5
47 DECODE(66,48,DATA)INTER,LENGTH,ROWID,PAVWID,FUNCLS,STRCOM,GRADE,
  1ADT,ACCID,TRCONT,SPDLMT,NEPKG,SWPKG,CRBTYP,SIDWLK,NOLANE,LOAD,
  2BUSRT,SCHRT,ACCESS,COND
48 FORMAT (I1,F4.0,2F3.0,3I1,F5.0,I2,I4,I2,10I1)
   WRITE (6,50)PNO,CRDTYP,CHANGE,TRANCD,INTER,LENGTH,ROWID,PAVWID,
  *FUNCLS,STRCOM,GRADE,
  1ADT,ACCID,TRCONT,SPDLMT,NEPKG,SWPKG,CRBTYP,SIDWLK,NOLANE,LOAD,
  2BUSRT,SCHRT,ACCESS,COND
50 FORMAT (5X,I6,I2,I4,I2,I1,F4.0,2F3.0,3I1,F5.0,I2,I4,I2,10I1)
   GO TO 5
57 DECODE(66,58,DATA)PRIZON,SECZON,TERZON,MNCOMP,SCCOMP,TDCOMP,
  1MNLUSE,SCLUSE,TDLUSE
58 FORMAT(6I2,3I4)
   WRITE (6,60)PNO,CRDTYP,CHANGE,TRANCD,PRIZON,SECZON,TERZON,MNCOMP,
  *SCCOMP,TDCOMP,
  1MNLUSE,SCLUSE,TDLUSE
60 FORMAT (5X,I6,I2,I4,I2,6I2,3I4)
   GO TO 5
67 WRITE (6,68)PNO
68 FORMAT (11H PARCEL NO ,I6,41H HAS A DATA CARD WITH AN INCORRECT NU
  1MBER)
   GO TO 5
99 CONTINUE
   REWIND 1
   END
```

Program 9: Read the Zone Name-Grid Coordinate File

This program reads the Zone Name-Grid Coordinate tape file and gives a complete printed listing of the file. The listing can be used to check the accuracy of the data and the completeness of the file. The tape used for the file must be noted on the program control cards.

PROGRAM 9

READ TAPE, PRINT COMPLETE LIST FOR ZONE NAME - GRID COORDINATE FILE

```
3484,MAXMAN.
REQUFST(TAPE2,HI,E). MOUNT CSC TAPE 775. RING(OUT).
RUN(S).
LGO.
'
      PROGRAM ZON(INPUT,OUTPUT,
     1      TAPE5=INPUT,TAPE6=OUTPUT,TAPE2)
      INTEGER X(4),Y(4)
      DIMENSION ZON(4)
    5 READ(2,6)ZON,X(1),Y(1),X(2),Y(2),X(3),Y(3),X(4),Y(4)
    6 FORMAT (2A6,A2,A6,1X,I6,1X,I6,2X,I6,1X,I6,2X,I6,1X,I6,2X,I6,1X,I6)
      IF(EOF,2) 99,4
    4 WRITE (6,7)ZON,X(1),Y(1),X(2),Y(2),X(3),Y(3),X(4),Y(4)
    7 FORMAT (5X,2A6,A2,A6,1X,I6,1X,I6,2X,I6,1X,I6,2X,I6,1X,I6,2X,I6,1X,
     1I6)
      GO TO 5
   99 CONTINUE
      REWIND 2
      END
```

Program 10: Update the Parcel Number-Grid Coordinate-Address File

This program reads new data and changes the information in the existing Parcel Number-Grid Coordinate-Address File to match the new information. The update data cards must be complete; all old and new information must be included. Only cards that have new information on them need be used in the update cycle. This program enables information to be periodically rendered current without initializing an entire new tape file. The new information must be read onto tape via Program 1 before this program can utilize the information. The tapes used for each file must be noted on the program control cards.

PROGRAM 10

UPDATE PARCEL NUMBER - GRID COORDINATE ADDRESS FILE

```
3484,MAXMAN.
REQUEST(TAPE3,HI,N). MOUNT CSC TAPE 774. RING(IN).
REQUEST(TAPE2,HI,E). MOUNT CSC TAPE 775. RING(OUT).
REQUEST(TAPE1,HI,E). MOUNT CSC TAPE 776. RING(OUT).
RUN(S).
LGO.
'
      PROGRAM COOR(INPUT,OUTPUT,
     1      TAPE5=INPUT,TAPE6=OUTPUT,TAPE1,TAPE2,TAPE3)
      INTEGER PNO,XCOORD,YCOORD
      INTEGER ADDRES(9)
      DIMENSION IADRES(9)
    4 CONTINUE
C   READ OLD INFORMATION
      READ(1,6)PNO,XCOORD,YCOORD,ADDRES
    6 FORMAT (I6,1X,I6,1X,I6,1X,8A6,A3)
      REWIND 2
      IF(EOF,1)99,5
C   READ NEW INFORMATION
    5 READ(2,6)IPNO,IX,IY,IADRES
      IF(EOF,2)51,13
   13 IF(IPNO.EQ.PNO) GO TO 17
      GO TO 5
   17 DO 69 I=1,9
      ADDRES(I)=IADRES(I)
   69 CONTINUE
      XCOORD=IX
      YCOORD=IY
   51 WRITE(3,6)PNO,XCOORD,YCOORD,ADDRES
      WRITE (6,7)PNO,XCOORD,YCOORD,ADDRES
    7 FORMAT (5X,I6,1X,I6,1X,I6,1X,8A6,A3)
      GO TO 4
   99 CONTINUE
      END FILE 3
      REWIND 1
      REWIND 2
      REWIND 3
      END
```

Program 11: Update the General Data File

This program reads new data and changes the information in the existing General Data File to match the new information. The update data cards must be complete; all old and new information must be included. Only cards that have new information on them need be used in the update cycle. This program enables information to be periodically rendered current without initializing an entire new tape file. The new information must be read onto tape via Program 3 before this program can utilize the information. The tapes used for each file must be noted on the program control cards.

PROGRAM 11

UPDATE GENERAL DATA FILE

```
3484,MAXMAN,CM70000.
REQUEST(TAPE1,HI,N). MOUNT CSC TAPE 622. THIS IS JHRP TAPE 28. RING(IN).
REQUEST(TAPE4,HI,E). MOUNT CSC TAPE 776. RING(OUT).
REQUEST(TAPE2,HI,E). MOUNT CSC TAPE 774.  RING(OUT).
RUN(S).
LGO.
'
      PROGRAM MAIN(INPUT,OUTPUT,
     1       TAPE5=INPUT,TAPE6=OUTPUT,TAPE1,TAPE4,TAPE2)
      INTEGER PNO,CRDTYP,CHANGE,TRANCD,DATA,OPNO,OLUSE,NULUSE,OWNER,
     1YRSUB,EASEMT,LNDMK,NEIGH,NOSTRUT,OLZON,NUZON,ZONREQ,ZONVAR,
     2COMUSE,FLAG,WATER,SEWER,ELECT,GASS,WELL,SEPTIC,EMPARK,CUPARK,
     3RESPK,COMPK,SALEDT,GLARE,HEAT,VIBR,SMELL,GAS,RADIAT,NOISE,ELINT,
     4SMOKE,OLBLDG,NUBLDG,YRBLT,FND,FRAME,SIDING,ROOF,STRTYP,BLDCON,
     5OLSUSE,NUSUSE,TOTEMP,PEAKEM,OPTEMP,NOROOM,MOT5,M6T18,M19T25,
     6YRPRMT,NOFLR,BASMNT,NODU,VIOL,NOVIOL,NOFST,BLDKEY,OLOC,NULOC,
     7M26T64,MGT64,FOT5,F6T18,F19T25,F26T62,FGT62,F14T44,VEHOWN,POLCAL,
     8FIRECAL,WELFAR,NODIS,DISEAS,INTER, FUNCLS,STRCOM,GRADE,ACCID,
     9TRCONT,SPDLMT,NEPKG,SWPKG,CRBTYP,SIDWLK,NOLANE,LOAD,BUSRT,SCHRT,
     1ACCESS,COND,PRIZON,SECZON,TERZON,MNCOMP,SCCOMP,TDCOMP,MNLUSE,
     2SCLUSE,TDLUSE,LND,YPCH
      REAL FRONT,AREA,ASVAL,LDAREA,VALIMP,TOTVAL,SALEPR,COSTPR,TOTARE,
     1FSTARE,SETBK,REQBK,RECOST,INCOME,RENT,LENGTH,ROWID,PAVWID,ADT
      DIMENSION DATA(7)
      DIMENSION IDATA(7)
    4 CONTINUE
C   READ OLD INFORMATION
      READ(4,6)PNO,CRDTYP,CHANGE,TRANCD,DATA
      REWIND 2
      IF(EOF,4) 99,5
C   READ UPDATE INFORMATION
    5 READ(2,6) IPNO,ICRDTY,ICHANGE,ITRANC,IDATA
    6 FORMAT (I6,I2,I4,I2,6A10,A6)
      IF(EOF,2)51,13
   13 IF(PNO.EQ.IPNO) GO TO 199
      GO TO 5
  199 IF(CRDTYP.EQ.ICRDTY) GO TO 200
      GO TO 5
  200 PNO=IPNO
      CRDTYP=ICRDTY
      CHANGE=ICHANGE
      TRANCD=ITRANC
      DO 11 I=1,7
      DATA(I)=IDATA(I)
   11 CONTINUE
   51 IF(CRDTYP.EQ. 1) GO TO 3
      IF (CRDTYP .EQ. 2) GO TO 17
      IF ( CRDTYP .EQ. 3) GO TO 27
      IF (CRDTYP .EQ. 4) GO TO 37
      IF (CRDTYP .EQ. 12) GO TO 47
      IF (CRDTYP .EQ. 11) GO TO 57
```

PROGRAM 11, CONTINUED

```
      GO TO 67
    3 CONTINUE
    7 DECODE(66,8,DATA)OLPNO,OLUSE,NULUSE,OWNER,FRONT,AREA,YRSUB,ASVAL
     1,EASEMT,LNDMK,NEIGH,LND,NOSTRT,YRCH,OLZON,NUZON,ZONREQ,ZONVAR,
     2COMUSE,FLAG,WATER,SEWER,ELECT,GASS,WELL,SEPTIC
    8 FORMAT (I6,I4,I4,I3,F4.0,F6.0,I3,F5.0,4I1,4I2,I4,
     1I4,I2,7I1)
      WRITE(6,10)PNO,CRDTYP,CHANGE,TRANCD,OLPNO,OLUSE,NULUSE,OWNER,FRONT
     *,AREA,YRSUB,ASVAL
     1,EASEMT,LNDMK,NEIGH,LND,NOSTRT,YRCH,OLZON,NUZON,ZONREQ,ZONVAR,
     2COMUSE,FLAG,WATER,SEWER,ELECT,GASS,WELL,SEPTIC
   10 FORMAT (5X,I6,I2,I4,I2,I6,2I4,I3,F4.0,F6.0,I3,F5.0,4I1,4I2,I4,I4,
     1I2,7I1)
      WRITE (1,9)PNO,CRDTYP,CHANGE,TRANCD,OLPNO,OLUSE,NULUSE,OWNER,FRONT
     *,AREA,YRSUB,ASVAL
     1,EASEMT,LNDMK,NEIGH,LND,NOSTRT,YRCH,OLZON,NUZON,ZONREQ,ZONVAR,
     2COMUSE,FLAG,WATER,SEWER,ELECT,GASS,WELL,SEPTIC
    9 FORMAT (I6,I2,I4,I2,I6,2I4,I3,F4.0,F6.0,I3,F5.0,4I1,4I2,I4,I4,I2,
     17I1)
      GO TO 4
   17 DECODE(66,18,DATA)EMPARK,CUPARK,RESPK,COMPK,LDAREA,VALIMP,
     1TOTVAL,SALEDT,SALEPR,GLARE,HEAT,VIBR,SMELL,GAS,RADIAT,NOISE,
     2ELINT,SMOKE
   18 FORMAT (4I4,F3.0,2F5.0,I2,F5.0,9I1)
      WRITE (6,20)PNO,CRDTYP,CHANGE,TRANCD,EMPARK,CUPARK,RESPK,COMPK,
     *LDAREA,VALIMP,
     1TOTVAL,SALEDT,SALEPR,GLARE,HEAT,VIBR,SMELL,GAS,RADIAT,NOISE,
     2ELINT,SMOKE
   20 FORMAT (5X,I6,I2,I4,I2,4I4,F3.0,2F5.0,I2,F5.0,9I1)
      WRITE (1,19)PNO,CRDTYP,CHANGE,TRANCD,EMPARK,CUPARK,RESPK,COMPK,
     *LDAREA,VALIMP,
     1TOTVAL,SALEDT,SALEPR,GLARE,HEAT,VIBR,SMELL,GAS,RADIAT,NOISE,
     2ELINT,SMOKE
   19 FORMAT (I6,I2,I4,I2,4I4,F3.0,2F5.0,I2,F5.0,9I1)
      GO TO 4
   27 DECODE(66,28,DATA)OLBLDG,NUBLDG,YRBLT,FND,FRAME,SIDING,ROOF,
     1STRTYP,BLDCON,YRPRMT,COSTPR,NOFLR,TOTARE,BASMNT,FSTARE,NODU,
     2SETBK,REQBK,RECOST,VIOL,NOVIOL,NOEST
   28 FORMAT (2I2,I3,4I1,I2,I1,I2,F6.0,I2,F7.0,I1,F6.0,I3,3F3.0,I1,2I2)
      WRITE (6,30)PNO,CRDTYP,CHANGE,TRANCD,OLBLDG,NUBLDG,YRBLT,FND,FRAME
     *,SIDING,ROOF,
     1STRTYP,BLDCON,YRPRMT,COSTPR,NOFLR,TOTARE,BASMNT,FSTARE,NODU,
     2SETBK,REQBK,RECOST,VIOL,NOVIOL,NOEST
   30 FORMAT (5X,I6,I2,I4,I2,2I2,I3,4I1,I2,I1,I2,F6.0,I2,F7.0,I1,F6.0,I3
     *,3F3.0,I1,2I2)
      WRITE (1,29)PNO,CRDTYP,CHANGE,TRANCD,OLBLDG,NUBLDG,YRBLT,FND,FRAME
     *,SIDING,ROOF,
     1STRTYP,BLDCON,YRPRMT,COSTPR,NOFLR,TOTARE,BASMNT,FSTARE,NODU,
     2SETBK,REQBK,RECOST,VIOL,NOVIOL,NOEST
   29 FORMAT (I6,I2,I4,I2,2I2,I3,4I1,I2,I1,I2,F6.0,I2,F7.0,I1,F6.0,I3,
     *,3F3.0,I1,2I2)
      GO TO 4
   37 DECODE(66,38,DATA)BLDKEY,OLOC,NULOC,OLSUSE,NUSUSE,TOTEMP,
     1PEAKEM ,OPTEMP,NOROOM,MOT5,M6T18,M19T25,M26T64,MGT64,FOT5,F6T18,
```

```
  2F19T25,F26T62,FGT62,F14T44,INCOME,VEHOWN,POLCAL,FIRECAL,WELFAR,
  3NODIS,DISEAS,RENT
38 FORMAT (3I2,5I4,12I2,F3.0,3I2,2I1,I2,F3.0)
   WRITE (6,40)PNO,CRDTYP,CHANGE,TRANCD,BLDKEY,OLOC,NULOC,OLSUSE,
  *NUSUSE,TOTEMP,
  1PEAKEM ,OPTEMP,NOROOM,MOT5,M6T18,M19T25,M26T64,MGT64,FOT5,F6T18,
  2F19T25,F26T62,FGT62,F14T44,INCOME,VEHOWN,POLCAL,FIRECAL,WELFAR,
  3NODIS,DISEAS,RENT
40 FORMAT (5X,I6,I2,I4,I2,3I2,5I4,12I2,F3.0,3I2,2I1,I2,F3.0)
   WRITE (1,39)PNO,CRDTYP,CHANGE,TRANCD,BLDKEY,OLOC,NULOC,OLSUSE,
  *NUSUSE,TOTEMP,
  1PEAKEM ,OPTEMP,NOROOM,MOT5,M6T18,M19T25,M26T64,MGT64,FOT5,F6T18,
  2F19T25,F26T62,FGT62,F14T44,INCOME,VEHOWN,POLCAL,FIRECAL,WELFAR,
  3NODIS,DISEAS,RENT
39 FORMAT (I6,I2,I4,I2,3I2,5I4,12I2,F3.0,3I2,2I1,I2,F3.0)
   GO TO 4
47 DECODE(66,48,DATA)INTER,LENGTH,ROWID,PAVWID,FUNCLS,STRCOM,GRADE,
  1ADT,ACCID,TRCONT,SPDLMT,NEPKG,SWPKG,CRBTYP,SIDWLK,NOLANE,LOAD,
  2BUSRT,SCHRT,ACCESS,COND
48 FORMAT (I1,F4.0,2F3.0,3I1,F5.0,I2,I4,I2,10I1)
   WRITE (6,50)PNO,CRDTYP,CHANGE,TRANCD,INTER,LENGTH,ROWID,PAVWID,
  *FUNCLS,STRCOM,GRADE,
  1ADT,ACCID,TRCONT,SPDLMT,NEPKG,SWPKG,CRBTYP,SIDWLK,NOLANE,LOAD,
  2BUSRT,SCHRT,ACCESS,COND
50 FORMAT (5X,I6,I2,I4,I2,I1,F4.0,2F3.0,3I1,F5.0,I2,I4,I2,10I1)
   WRITE (1,49)PNO,CRDTYP,CHANGE,TRANCD,INTER,LENGTH,ROWID,PAVWID,
  *FUNCLS,STRCOM,GRADE,
  1ADT,ACCID,TRCONT,SPDLMT,NEPKG,SWPKG,CRBTYP,SIDWLK,NOLANE,LOAD,
  2BUSRT,SCHRT,ACCESS,COND
49 FORMAT (I6,I2,I4,I2,I1,F4.0,2F3.0,3I1,F5.0,I2,I4,I2,10I1)
   GO TO 4
57 DECODE(66,58,DATA)PRIZON,SECZON,TERZON,MNCOMP,SCCOMP,TDCOMP,
  1MNLUSE,SCLUSE,TDLUSE
58 FORMAT(6I2,3I4)
   WRITE (6,60)PNO,CRDTYP,CHANGE,TRANCD,PRIZON,SECZON,TERZON,MNCOMP,
  *SCCOMP,TDCOMP,
  1MNLUSE,SCLUSE,TDLUSE
60 FORMAT (5X,I6,I2,I4,I2,6I2,3I4)
   WRITE (1,59)PNO,CRDTYP,CHANGE,TRANCD,PRIZON,SECZON,TERZON,MNCOMP,
  *SCCOMP,TDCOMP,
  1MNLUSE,SCLUSE,TDLUSE
59 FORMAT (I6,I2,I4,I2,6I2,3I4)
   GO TO 4
67 WRITE (6,68)PNO
68 FORMAT (11H PARCEL NO ,I6,41H HAS A DATA CARD WITH AN INCORRECT NU
  1MBER)
   GO TO 4
99 CONTINUE
   END FILE 1
   REWIND 1
   REWIND 2
   REWIND 4
   END
```

Program 12: Update the Zone Name-Grid Coordinate File

This program reads new data and changes the information in the existing Zone Name-Grid Coordinate File to match the new information. The update data cards must be complete; all old and new information must be included. Only cards that have new information on them need be used in the update cycle. This program enables information to be periodically rendered current without initializing an entire tape file. The new information must be read onto tape via Program 5 before this program can utilize the information. The tapes used for each file must be noted on the program control cards.

PROGRAM 12

UPDATE ZONE NAME - GRID COORDINATE FILE

```
3484,MAXMAN.
REQUEST(TAPE1,HI,E). MOUNT CSC TAPE 774. RING(OUT).
REQUEST(TAPE3,HI,E). MOUNT CSC TAPE 775. RING(OUT).
REQUEST(TAPE2,HI,N). MOUNT CSC TAPE 776. RING(IN).
RUN(S).
LGO.
,
      PROGRAM ZON(INPUT,OUTPUT,
     1      TAPE5=INPUT,TAPE6=OUTPUT,TAPE1,TAPE2,TAPE3)
      INTEGER X(4),Y(4)
      INTEGER ZON(4)
      DIMENSION IZON(4)
      DIMENSIONIX(4),IY(4)
    4 CONTINUE
C   READ OLD INFORMATION
      READ(1,6)ZON,X(1),Y(1),X(2),Y(2),X(3),Y(3),X(4),Y(4)
    6 FORMAT (2A6,A2,A6,1X,I6,1X,I6,2X,I6,1X,I6,2X,I6,1X,I6,2X,I6,1X,I6)
      REWIND 3
      IF(EOF,1)99,5
C   READ NEW INFORMATION
    5 READ(3,6)IZON,IX(1),IY(1),IX(2),IY(2),IX(3),IY(3),IX(4),IY(4)
      IF(EOF,3) 51,13
   13 IF(ZON(1).EQ.IZON(1))GO TO 14
      GO TO 5
   14 IF(ZON(2).EQ.IZON(2))GO TO 15
      GO TO 5
   15 IF(ZON(3).EQ.IZON(3))GO TO 16
      GO TO 5
   16 IF(ZON(4).EQ.IZON(4))GO TO 17
      GO TO 5
   17 DO 69 I=1,4
      X(I)=IX(I)
      Y(I)=IY(I)
   69 CONTINUE
   51 WRITE(2,6)ZON,X(1),Y(1),X(2),Y(2),X(3),Y(3),X(4),Y(4)
      WRITE(6,7)ZON,X(1),Y(1),X(2),Y(2),X(3),Y(3),X(4),Y(4)
    7 FORMAT (5X,2A6,A2,A6,1X,I6,1X,I6,2X,I6,1X,I6,2X,I6,1X,I6,2X,I6,1X,
     1I6)
      GO TO 4
   99 CONTINUE
      END FILE 2
      REWIND 1
      REWIND 2
      REWIND 3
      END
```

Program 13: Retrieve a List of X and Y from the General Data File

This program will retrieve a list of any two variables from the General Data File. The variables to be listed must be noted in the program, along with the maximum list size and the variable format. The system name for the two variables must also be noted in the program. With this information, this program will yield a list of the two variables on a parcel by parcel basis. The tape to be used must be noted on the program control cards.

PROGRAM 13

RETRIEVE LIST OF X AND Y FROM THE GENERAL DATA FILE

```
3484,MAXMAN,CM70000.
REQUEST(TAPE1,HI,E). MOUNT CSC TAPE 774. RING(OUT).
RUN(S).
LGO.
,
      PROGRAM MAIN(INPUT,OUTPUT,
     1        TAPE5=INPUT,TAPE6=OUTPUT,TAPE1)
      INTEGER PNO,CRDTYP,CHANGE,TRANCD,DATA,OPNO,OLUSE,NULUSE,OWNER,
     1YRSUB,EASEMT,LNDMK,NEIGH,NOSTRUT,OLZON,NUZON,ZONREQ,ZONVAR,
     2COMUSE,FLAG,WATER,SEWER,ELECT,GASS,WELL,SEPTIC,EMPARK,CUPARK,
     3RESPK,COMPK,SALEDT,GLARE,HEAT,VIBR,SMELL,GAS,RADIAT,NOISE,ELINT,
     4SMOKE,OLBLDG,NUBLDG,YRBLT,FND,FRAME,SIDING,ROOF,STRTYP,BLDCON,
     5OLSUSE,NUSUSE,TOTEMP,PEAKEM,OPTEMP,NOROOM,MOT5,M6T18,MI9T25,
     6YRPRMT,NOFLR,BASMNT,NODU,VIOL,NOVIOL,NOEST,BLDKEY,OLOC,NULOC,
     7M26T64,MGT64,FOT5,F6T18,F19T25,F26T62,FGT62,F14T44,VEHOWN,POLCAL,
     8FIRECAL,WELFAR,NODIS,DISEAS,INTER, FUNCLS,STRCOM,GRADE,ACCID,
     9TRCONT,SPDLMT,NEPKG,SWPKG,CRBTYP,SIDWLK,NOLANE,LOAD,BUSRT,SCHRT,
     1ACCESS,COND,PRIZON,SECZON,TERZON,MNCOMP,SCCOMP,TDCOMP,MNLUSE,
     2SCLUSE,TDLUSE,LND,YRCH
      REAL FRONT,AREA,ASVAL,LDAREA,VALIMP,TOTVAL,SALEPR,COSTPR,TOTARE,
     1FSTARE,SETBK,REQBK,RECOST,INCOME,RENT,LENGTH,ROWID,PAVWID,ADT
      DIMENSION DATA(7)
      INTEGER XY
C   FORMAT FOR X AND Y
  600 FORMAT (I4,I6)
C   MAXIMUM NUMBER OF ITEMS BEING LISTED IS PUT IN PARENTHESIS
      DIMENSION IPNO(100)
      DIMENSION XX(100)
C   VARIABLE THAT IS BEING LISTED AS Y
      EQUIVALENCE (Y,RESPK)
C   VARIABLE THAT IS BEING LISTED AS X
      EQUIVALENCE (X,NULUSE)
      K=0
      XY=0
C   CARD THAT VARIABLE X IS ON
      I=1
C   CARD THAT VARIABLE Y IS ON
      J=2
    5 READ(1,6)PNO,CRDTYP,CHANGE,TRANCD,DATA
    6 FORMAT (I6,I2,I4,I2,6A10,A6)
      IF(EOF,1)199,100
  100 IF(CRDTYP.EQ.I) GO TO 99
      GO TO 5
   99 CONTINUE
    4 IF ( CRDTYP .EQ. 1) GO TO 3
      IF (CRDTYP .EQ. 2) GO TO 17
      IF ( CRDTYP .EQ. 3) GO TO 27
      IF (CRDTYP .EQ. 4) GO TO 37
      IF (CRDTYP .EQ. 12) GO TO 47
```

PROGRAM 13, CONTINUED

```
      IF (CRDTYP .EQ. 11) GO TO 57
    3 CONTINUE
    7 DECODE(66,8,DATA)OLPNO,OLUSE,NULUSE,OWNER,FRONT,AREA,YRSUB,ASVAL
     1,EASEMT,LNDMK,NEIGH,LND,NOSTRT,YRCH,OLZON,NUZON,ZONREQ,ZONVAR,
     2COMUSE,FLAG,WATER,SEWER,ELECT,GASS,WELL,SEPTIC
    8 FORMAT (I6,I4,I4,I3,F4.0,F6.0,I3,F5.0,4I1,4I2,I4,
     1I4,I2,7I1)
      GO TO 101
   17 DECODE(66,18,DATA)EMPARK,CUPARK,RESPK,COMPK,LDAREA,VALIMP,
     1TOTVAL,SALEDT,SALEPR,GLARE,HEAT,VIBR,SMELL,GAS,RADIAT,NOISE,
     2ELINT,SMOKE
   18 FORMAT (4I4,F3.0,2F5.0,I2,F5.0,9I1)
      GO TO 101
   27 DECODE(66,28,DATA)OLBLDG,NUBLDG,YRBLT,FND,FRAME,SIDING,ROOF,
     1STRTYP,BLDCON,YRPRMT,COSTPR,NOFLR,TOTARE,BASMNT,FSTARE,NODU,
     2SETBK,REQBK,RECOST,VIOL,NOVIOL,NOEST
   28 FORMAT (2I2,I3,4I1,I2,I1,I2,F6.0,I2,F7.0,I1,F6.0,I3,3F3.0,I1,2I2)
      GO TO 101
   37 DECODE(66,38,DATA)BLDKEY,OLOC,NULOC,OLSUSE,NUSUSE,TOTEMP,
     1PEAKEM ,OPTEMP,NOROOM,MOT5,M6T18,M19T25,M26T64,MGT64,FOT5,F6T18,
     2F19T25,F26T62,FGT62,F14T44,INCOME,VFHOWN,POLCAL,FIRECAL,WELFAR,
     3NODIS,DISEAS,RENT
   38 FORMAT (3I2,5I4,12I2,F3.0,3I2,2I1,I2,F3.0)
      GO TO 101
   47 DECODE(66,48,DATA)INTER,LENGTH,ROWID,PAVWID,FUNCLS,STRCOM,GRADE,
     1ADT,ACCID,TRCONT,SPDLMT,NEPKG,SWPKG,CRBTYP,SIDWLK,NOLANE,LOAD,
     2BUSRT,SCHRT,ACCESS,COND
   48 FORMAT (I1,F4.0,2F3.0,3I1,F5.0,I2,I4,I2,10I1)
      GO TO 101
   57 DECODE(66,58,DATA)PRIZON,SECZON,TERZON,MNCOMP,SCCOMP,TDCOMP,
     1MNLUSE,SCLUSE,TDLUSE
   58 FORMAT(6I2,3I4)
      GO TO 101
  101 K=K+1
      IPNO(K)=PNO
      XX(K)=X
      GO TO 5
  199 CONTINUE
      REWIND 1
   50 READ(1,6)PNO,CRDTYP,CHANGE,TRANCD,DATA
      IF(EOF,1)599,200
  200 IF(CRDTYP.EQ.J) GO TO 299
      GO TO 50
  299 DO 399  IL=1,K
      IF(IPNO(IL).EQ.PNO) GO TO 499
  399 CONTINUE
      GO TO 50
  499 CONTINUE
      IF(CRDTYP.EQ. 1) GO TO 603
      IF(CRDTYP.EQ. 2) GO TO 617
      IF(CRDTYP.EQ. 3) GO TO 627
      IF(CRDTYP.EQ. 4) GO TO 637
```

PROGRAM 13, CONTINUED

```
      IF(CRDTYP.EQ. 12) GO TO 647
      IF(CRDTYP.EQ. 11) GO TO 657
  603 CONTINUE
  607 DECODE(66,8,DATA)OLPNO,OLUSE,NULUSE,OWNER,FRONT,AREA,YRSUB,ASVAL
     1,EASEMT,LNDMK,NEIGH,LND,NOSTRT,YRCH,OLZON,NUZON,ZONREQ,ZONVAR,
     2COMUSE,FLAG,WATER,SEWEP,ELECT,GASS,WELL,SEPTIC
      GO TO 500
  617 DECODE(66,18,DATA)EMPARK,CUPARK,RESPK,COMPK,LDAREA,VALIMP,
     ITOTVAL,SALEDT,SALEPR,GLARE,HEAT,VIBR,SMELL,GAS,RADIAT,NOISE,
     2ELINT,SMOKE
      GO TO 500
  627 DECODE(66,28,DATA)OLBLDG,NUBLDG,YRBLT,FND,FRAME,SIDING,ROOF,
     1STRTYP,BLDCON,YRPRMT,COSTPR,NOFLR,TOTARE,BASMNT,FSTARE,NODU,
     2SETBK,REQBK,RECOST,VIOL,NOVIOL,NOEST
      GO TO 500
  637 DECODE(66,38,DATA)BLDKEY,OLOC,NULOC,OLSUSE,NUSUSE,TOTEMP,
     IPEAKEM ,OPTEMP,NOROOM,MOT5,M6T18,M19T25,M26T64,MGT64,FOT5,F6T18,
     2F19T25,F26T62,FGT62,F14T44,INCOME,VEHOWN,POLCAL,FIRECAL,WELFAR,
     3NODIS,DISEAS,RENT
      GO TO 500
  647 DECODE(66,48,DATA)INTER,LENGTH,ROWID,PAVWID,FUNCLS,STRCOM,GRADE,
     IADT,ACCID,TRCONT,SPDLMT,NEPKG,SWPKG,CRBTYP,SIDWLK,NOLANE,LOAD,
     2BUSRT,SCHRT,ACCESS,COND
      GO TO 500
  657 DECODE(66,58,DATA)PRIZON,SECZON,TERZON,MNCOMP,SCCOMP,TDCOMP,
     1MNLUSE,SCLUSE,TDLUSE
      GO TO 500
  500 WRITE(6,600) XX(IL),Y
      GO TO 50
  599 CONTINUE
      REWIND 1
      END
```

Program 14: Retrieve the Sum of Y For X = Test

This program will sum a variable for a specific value of another variable (from the General Data File). The variable to be summed, the variable [illegible]mmed over, the value to be summed over, and the variable format must be entered into the main program. With this information, this program can sum the values of one piece of data based on a particular value of another piece of data. The tape to be used must be noted on the program control cards.

PROGRAM 14

RETRIEVE SUM OF Y FOR A SPECIFIC X FROM THE GENERAL DATA FILE

```
3484,MAXMAN,CM70000.
REQUEST(TAPE1,HI,E). MOUNT CSC TAPE 774. RING(OUT).
RUN(S).
LGO.
,
      PROGRAM MAIN(INPUT,OUTPUT,
     1      TAPE5=INPUT,TAPE6=OUTPUT,TAPE1)
      INTEGER PNO,CRDTYP,CHANGE,TRANCD,DATA,OPNO,OLUSE,NULUSE,OWNER,
     1YRSUB,EASEMT,LNDMK,NEIGH,NOSTRUT,OLZON,NUZON,ZONREQ,ZONVAR,
     2COMUSE,FLAG,WATER,SEWER,ELECT,GASS,WELL,SEPTIC,EMPARK,CUPARK,
     3RESPK,COMPK,SALEDT,GLARE,HEAT,VIBR,SMELL,GAS,RADIAT,NOISE,ELINT,
     4SMOKE,OLBLDG,NUBLDG,YRBLT,FND,FRAME,SIDING,ROOF,STRTYP,BLDCON,
     5OLSUSE,NUSUSE,TOTEMP,PEAKEM,OPTEMP,NOROOM,MOT5,M6T18,M19T25,
     6YRPRMT,NOFLR,BASMNT,NODU,VIOL,NOVIOL,NOEST,BLDKEY,OLOC,NULOC,
     7M26T64,MGT64,FOT5,F6T18,F19T25,F26T62,FGT62,F14T44,VEHOWN,POLCAL,
     8FIRECAL,WELFAR,NODIS,DISEAS,INTER, FUNCLS,STRCOM,GRADE,ACCID,
     9TRCONT,SPDLMT,NEPKG,SWPKG,CRBTYP,SIDWLK,NOLANE,LOAD,BUSRT,SCHRT
     1ACCESS,COND,PRIZON,SECZON,TERZON,MNCOMP,SCCOMP,TDCOMP,MNLUSE,
     2SCLUSE,TDLUSE,LND,YRCH
      REAL FRONT,AREA,ASVAL,LDAREA,VALIMP,TOTVAL,SALEPR,COSTPR,TOTARE,
     1FSTARE,SETBK,REQBK,RECOST,INCOME,RENT,LENGTH,ROWID,PAVWID,ADT
      DIMENSION DATA(7)
      INTEGER XY
      INTEGER X,TEST,Y
C  FORMAT FOR X AND Y, SINCE Y IS SUMMED LEAVE EXTRA DIGITS
  600 FORMAT (I4,I6)
C  MAXIMUM NUMBEP OF ITEMS BEING SUMMED IS PUT IN PARENTHESIS
      DIMENSION IPNO(100)
C VARIABLE THAT IS BEING SUMMED
      EQUIVALENCE (Y,RESPK)
C  VARIABLE BEING SUMMED OVER
      EQUIVALENCE (X,NULUSE)
      K=0
      XY=0
C  VALUE OF THE VARIABLE THAT SUM IS BEING TAKEN OVER
      TEST=11
C  CARD THAT VARIABLE X IS ON
      I=1
C  CARD THAT VARIABLE Y IS ON
      J=2
      REWIND 1
    5 READ(1,6)PNO,CRDTYP,CHANGE,TRANCD,DATA
    6 FORMAT (I6,I2,I4,I2,6A10,A6)
      IF(EOF,1)199,100
  100 IF(CRDTYP.EQ.I) GO TO 99
      GO TO 5
   99 CONTINUE
    4 IF ( CRDTYP .EQ. 1) GO TO 3
      IF (CRDTYP .EQ. 2) GO TO 17
```

PROGRAM 14, CONTINUED

```
    IF ( CRDTYP .EQ. 3) GO TO 27
    IF (CRDTYP .EQ. 4) GO TO 37
    IF (CRDTYP .EQ. 12) GO TO 47
    IF (CRDTYP .EQ. 11) GO TO 57
  3 CONTINUE
  7 DECODE(66,8,DATA)OLPNO,OLUSE,NULUSE,OWNER,FRONT,AREA,YRSUB,ASVAL
   1,EASEMT,LNDMK,NEIGH,LND,NOSTRT,YRCH,OLZON,NUZON,ZONREQ,ZONVAR,
   2COMUSE,FLAG,WATER,SEWER,ELECT,GASS,WELL,SEPTIC
  8 FORMAT (I6,I4,I4,I3,F4.0,F6.0,I3,F5.0,4I1,4I2,I4,
   1I4,I2,7I1)
    GO TO 999
 17 DECODF(66,18,DATA)FMPARK,CUPARK,RFSPK,COMPK,LDAREA,VALIMP,
   1TOTVAL,SALEDT,SALEPR,GLARE,HEAT,VIBR,SMELL,GAS,RADIAT,NOISE,
   2ELINT,SMOKE
 18 FORMAT (4I4,F3.0,2F5.0,I2,F5.0,9I1)
    GO TO 999
 27 DECODE(66,28,DATA)OLBLDG,NUBLDG,YRBLT,FND,FRAME,SIDING,ROOF,
   1STRTYP,BLDCON,YRPRMT,COSTPR,NOFLR,TOTARE,BASMNT,FSTARE,NODU,
   2SETBK,REQBK,RECOST,VIOL,NOVIOL,NOEST
 28 FORMAT (2I2,I3,4I1,I2,I1,I2,F6.0,I2,F7.0,I1,F6.D,I3,3F3.0,I1,2I2)
    GO TO 999
 37 DECODF(66,38,DATA)BLDKEY,OLOC,NULOC,OLSUSE,NUSUSF,TOTEMP,
   1PEAKEM ,OPTEMP,NOROOM,MOT5,M6T18,M19T25,M26T64,MGT64,FOT5,F6T18,
   2F19T25,F26T62,FGT62,F14T44,INCOME,VEHOWN,POLCAL,FIRECAL,WELFAR,
   3NODIS,DISEAS,RENT
 38 FORMAT (3I2,5I4,12I2,F3.0,3I2,2I1,I2,F3.0)
    GO TO 999
 47 DECODF(66,48,DATA)INTFR,LENGTH,ROWID,PAVWID,FUNCLS,STRCOM,GRADE,
   1ADT,ACCID,TRCONT,SPDLMT,NEPKG,SWPKG,CRBTYP,SIDWLK,NOLANE,LOAD,
   2BUSRT,SCHRT,ACCESS,COND
 48 FORMAT (I1,F4.0,2F3.0,3I1,F5.0,I2,I4,I2,10I1)
    GO TO 999
 57 DECODE(66,58,DATA)PRIZON,SECZON,TERZON,MNCOMP,SCCOMP,TDCOMP,
   1MNLUSE,SCLUSE,TDLUSE
 58 FORMAT(6I2,3I4)
    GO TO 999
999 IF(X.EQ.TEST) GO TO 101
    GO TO 5
101 K=K+1
    IPNO(K)=PNO
    GO TO 5
199 CONTINUE
    REWIND 1
 50 READ(1,6)PNO,CRDTYP,CHANGE,TRANCD,DATA
    IF(FOF,1)599,200
200 IF(CRDTYP.EQ.J) GO TO 299
    GO TO 50
299 DO 399  IL=1,K
    IF(IPNO(IL).EQ.PNO) GO TO 499
399 CONTINUE
    GO TO 50
499 CONTINUE
```

PROGRAM 14, CONTINUED

```
      IF(CRDTYP.EQ. 1) GO TO 603
      IF(CRDTYP.EQ. 2) GO TO 617
      IF(CRDTYP.EQ. 3) GO TO 627
      IF(CRDTYP.EQ. 4) GO TO 637
      IF(CRDTYP.EQ. 12) GO TO 647
      IF(CRDTYP.EQ. 11) GO TO 657
  603 CONTINUE
  607 DECODE(66,8,DATA)OLPNO,OLUSE,NULUSE,OWNER,FRONT,AREA,YRSUB,ASVAL
     1,EASEMT,LNDMK,NEIGH,LND,NOSTRT,YRCH,OLZON,NUZON,ZONREQ,ZONVAR,
     2COMUSE,FLAG,WATER,SEWER,ELECT,GASS,WELL,SEPTIC
      GO TO 500
  617 DECODE(66,18,DATA)EMPARK,CUPARK,RESPK,COMPK,LDAREA,VALIMP,
     1TOTVAL,SALEDT,SALEPR,GLARE,HEAT,VIBR,SMELL,GAS,RADIAT,NOISE,
     2FLINT,SMOKE
      GO TO 500
  627 DECODE(66,28,DATA)OLBLDG,NUBLDG,YRBLT,FND,FRAME,SIDING,ROOF,
     1STRTYP,BLDCON,YRPRMT,COSTPR,NOFLR,TOTARE,BASMNT,FSTARE,NODU,
     2SETBK,REQBK,RECOST,VIOL,NOVIOL,NOEST
      GO TO 500
  637 DECODE(66,38,DATA)BLDKEY,OLOC,NULOC,OLSUSE,NUSUSE,TOTEMP,
     1PEAKEM ,OPTEMP,NOROOM,MOT5,M6T18,M19T25,M26T64,MGT64,FOT5,F6T18,
     2F19T25,F26T62,FGT62,F14T44,INCOME,VEHOWN,POLCAL,FIRECAL,WELFAR,
     3NODIS,DISEAS,RENT
      GO TO 500
  647 DECODE(66,48,DATA)INTER,LENGTH,ROWID,PAVWID,FUNCLS,STRCOM,GRADE,
     1ADT,ACCID,TRCONT,SPDLMT,NERPKG,SWPKG,CRBTYP,SIDWLK,NOLANE,LOAD,
     2BUSRT,SCHRT,ACCESS,COND
      GO TO 500
  657 DECODE(66,58,DATA)PRIZON,SECZON,TERZON,MNCOMP,SCCOMP,TDCOMP,
     1MNLUSE,SCLUSE,TDLUSE
      GO  O 500
  500 XY=XY+Y
      GO TO 50
  599 WRITE(6,600) TEST,XY
      REWIND 1
      END
```

Program 15: Retrieve a List of Y for X = Test

This program will list one variable when the value of another variable equals a specified test value (from the General Data File). The variable to be listed, the variable to be listed over, the value of the variable to be listed over, the format for the variables and the maximum list size must be entered into the program. With this information this program can list the values of one data item based on a particular value of another data item. The tape to be used must be noted on the program control cards.

PROGRAM 15

RETRIEVE LIST OF Y FOR A SPECIFIC X FROM THE GENERAL DATA FILE

```
3484,MAXMAN,CM70000.
REQUEST(TAPE1,HI,E). MOUNT CSC TAPE 774. RING(OUT).
RUN(S).
LGO.
'
      PROGRAM MAIN(INPUT,OUTPUT,
     1        TAPE5=INPUT,TAPE6=OUTPUT,TAPE1)
      INTEGER PNO,CRDTYP,CHANGE,TRANCD,DATA,OPNO,OLUSE,NULUSE,OWNER,
     1YRSUB,EASEMT,LNDMK,NEIGH,NOSTRUT,OLZON,NUZON,ZONREQ,ZONVAR,
     2COMUSE,FLAG,WATER,SEWER,ELECT,GASS,WELL,SEPTIC,EMPARK,CUPARK,
     3RESPK,COMPK,SALEDT,GLARE,HEAT,VIBR,SMELL,GAS,RADIAT,NOISE,ELINT,
     4SMOKE,OLBLDG,NUBLDG,YRBLT,FND,FRAME,SIDING,ROOF,STRTYP,BLDCON,
     5OLSUSE,NUSUSE,TOTEMP,PEAKEM,OPTEMP,NOROOM,MOT5,M6T18,M19T25,
     6YRPRMT,NOFLR,BASMNT,NODU,VIOL,NOVIOL,NOEST,BLDKEY,OLOC,NULOC,
     7M26T64,MGT64,FOT5,F6T18,F19T25,F26T62,FGT62,F14T44,VEHOWN,POLCAL,
     8FIRECAL,WELFAR,NODIS,DISEAS,INTER, FUNCLS,STRCOM,GRADE,ACCID,
     9TRCONT,SPDLMT,NEPKG,SWPKG,CRBTYP,SIDWLK,NOLANE,LOAD,BUSRT,SCHRT,
     1ACCESS,COND,PRIZON,SECZON,TERZON,MNCOMP,SCCOMP,TDCOMP,MNLUSE,
     2SCLUSE,TDLUSE,LND,YRCH
      REAL FRONT,AREA,ASVAL,LDAREA,VALIMP,TOTVAL,SALEPR,COSTPR,TOTARE,
     1FSTARE,SETBK,REQBK,RECOST,INCOME,RENT,LENGTH,ROWID,PAVWID,ADT
      DIMENSION DATA(7)
      INTEGER X,TEST,Y
      INTEGER XY
C  FORMAT FOR X AND Y
  600 FORMAT(5X,I4,I6)
C  MAXIMUM NUMBER OF ITEMS BEING LISTED IS PUT IN PARENTHESIS
      DIMENSION IPNO(100)
      DIMENSION XX(100)
C  VARIABLE THAT IS BEING LISTED AS Y
      EQUIVALENCE (Y,RESPK)
C  VARIABLE THAT IS BEING LISTED AS X
      EQUIVALENCE (X,NULUSE)
C  VALUE OF THE VARIABLE THAT THE LIST IS BEING TAKEN OVER
      TEST=11
      K=0
      XY=0
C  CARD THAT VARIABLE X IS ON
      I=1
C  CARD THAT VARIABLE Y IS ON
      J=2
    5 READ(I,6)PNO,CRDTYP,CHANGE,TRANCD,DATA
    6 FORMAT (I6,I2,I4,I2,6A10,A6)
      IF(EOF,1)199,100
  100 IF(CRDTYP.EQ.1) GO TO 99
      GO TO 5
   99 CONTINUE
    4 IF ( CRDTYP .EQ. 1) GO TO 3
      IF (CRDTYP .EQ. 2) GO TO 17
```

PROGRAM 15, CONTINUED

```
      IF ( CRDTYP .EQ. 3) GO TO 27
      IF (CRDTYP .EQ. 4) GO TO 37
      IF (CRDTYP .EQ. 12) GO TO 47
      IF (CRDTYP .EQ. 11) GO TO 57
    3 CONTINUE
    7 DECODE(66,8,DATA)OLPNO,OLUSE,NULUSE,OWNER,FRONT,AREA,YRSUB,ASVAL
     1,EASEMT,LNDMK,NEIGH,LND,NOSTRT,YRCH,OLZON,NUZON,ZONREQ,ZONVAR,
     2COMUSE,FLAG,WATER,SEWER,ELFCT,GASS,WELL,SEPTIC
    8 FORMAT (I6,I4,I4,I3,F4.0,F6.0,I3,F5.0,4I1,4I2,I4,
     1I4,I2,7I1)
      GO TO 101
   17 DECODE(66,18,DATA)EMPARK,CUPARK,RESPK,COMPK,LDAREA,VALIMP,
     1TOTVAL,SALEDT,SALEPR,GLARE,HEAT,VIBR,SMELL,GAS,RADIAT,NOISE,
     2ELINT,SMOKE
   18 FORMAT (4I4,F3.0,2F5.0,I2,F5.0,9I1)
      GO TO 101
   27 DECODE(66,28,DATA)OLBLDG,NUBLDG,YRBLT,FND,FRAME,SIDING,ROOF,
     1STRTYP,BLDCON,YRPRMT,COSTPR,NOFLR,TOTARE,BASMNT,FSTARE,NODU,
     2SETPK,REQBK,PECOST,VIOL,NOVIOL,NOEST
   28 FORMAT (2I2,I3,4I1,I2,I1,I2,F6.0,I2,F7.0,I1,F6.0,I3,3F3.0,I1,2I2)
      GO TO 101
   37 DECODE(66,38,DATA)BLDKEY,OLOC,NULOC,OLSUSE,NUSUSE,TOTEMP,
     1PEAKEM ,OPTEMP,NOROOM,MOT5,M6T18,M19T25,M26T64,MGT64,FOT5,F6T18,
     2F19T25,F26T62,FGT62,F14T44,INCOME,VEHOWN,POLCAL,FIRECAL,WELFAR,
     3NODIS,DISEAS,RENT
   38 FORMAT (3I2,5I4,12I2,F3.0,3I2,2I1,I2,F3.0)
      GO TO 101
   47 DECODE(66,48,DATA)INTER,LENGTH,ROWID,PAVWID,FUNCLS,STRCOM,GRADE,
     1ADT,ACCID,TRCONT,SPDLMT,NEPKG,SWPKG,CRBTYP,SIDWLK,NOLANE,LOAD,
     2BUSRT,SCHRT,ACCESS,COND
   48 FORMAT (I1,F4.0,2F3.0,3I1,F5.0,I2,I4,I2,10I1)
      GO TO 101
   57 DECODE(66,58,DATA)PRIZON,SECZON,TERZON,MNCOMP,SCCOMP,TDCOMP,
     1MNLUSE,SCLUSE,TDLUSE
   58 FORMAT(6I2,3I4)
      GO TO 101
  101 IF(X.EQ.TEST) GO TO 102
      GO TO 5
  102 K=K+1
      IPNO(K)=PNO
      GO TO 5
  199 CONTINUE
      REWIND 1
   50 READ(1,6)PNO,CRDTYP,CHANGE,TRANCD,DATA
      IF(EOF,1)599,200
  200 IF(CRDTYP.EQ.J) GO TO 299
      GO TO 50
  299 DO 399  IL=1,K
      IF(IPNO(IL).EQ.PNO) GO TO 499
  399 CONTINUE
      GO TO 50
  499 CONTINUE
```

PROGRAM 15, CONTINUED

```
      IF(CRDTYP.EQ. 1) GO TO 603
      IF(CRDTYP.EQ. 2) GO TO 617
      IF(CRDTYP.EQ. 3) GO TO 627
      IF(CRDTYP.EQ. 4) GO TO 637
      IF(CRDTYP.EQ. 12) GO TO 647
      IF(CRDTYP.EQ. 11) GO TO 657
  603 CONTINUE
  607 DECODE(66,8,DATA)OLPNO,OLUSE,NULUSE,OWNER,FRONT,AREA,YRSUB,ASVAL
     1,EASEMT,LNDMK,NEIGH,LND,NOSTRT,YRCH,OLZON,NUZON,ZONREQ,ZONVAR,
     2COMUSE,FLAG,WATER,SEWER,ELECT,GASS,WELL,SEPTIC
      GO TO 500
  617 DECODE(66,18,DATA)EMPARK,CUPARK,RESPK,COMPK,LDAREA,VALIMP,
     1TOTVAL,SALEDT,SALEPR,GLARE,HEAT,VIBR,SMELL,GAS,RADIAT,NOISE,
     2ELINT,SMOKE
      GO TO 500
  627 DECODE(66,28,DATA)OLBLDG,NUBLDG,YRBLT,FND,FRAME,SIDING,ROOF,
     1STRTYP,BLDCON,YRPRMT,COSTPR,NOFLR,TOTARE,BASMNT,FSTARE,NODU,
     2SETBK,REQBK,RECOST,VIOL,NOVIOL,NOEST
      GO TO 500
  637 DECODE(66,38,DATA)BLDKEY,OLOC,NULOC,OLSUSE,NUSUSE,TOTEMP,
     1PEAKEM ,OPTEMP,NOROOM,MOT5,M6T18,M19T25,M26T64,MGT64,FOT5,F6T18,
     2F19T25,F26T62,FGT62,F14T44,INCOME,VEHOWN,POLCAL,FIRECAL,WELFAR,
     3NODIS,DISFAS,RENT
      GO TO 500
  647 DECODE(66,48,DATA)INTER,LENGTH,ROWID,PAVWID,FUNCLS,STRCOM,GRADE,
     1ADT,ACCID,TRCONT,SPDLMT,NEPKG,SWPKG,CRBTYP,SIDWLK,NOLANE,LOAD,
     2BUSRT,SCHRT,ACCESS,COND
      GO TO 500
  657 DECODE(66,58,DATA)PRIZON,SECZON,TERZON,MNCOMP,SCCOMP,TDCOMP,
     1MNLUSE,SCLUSE,TDLUSE
      GO TO 500
  500 WRITE(6,600) TEST,Y
      GO TO 50
  599 CONTINUE
      REWIND 1
      END
```

Program 16: Retrieve X for Particular Parcel Numbers

This program will retrieve the value of a specified variable for each parcel number read into the program. The program listing contains sample data. This program will read the parcel numbers that are entered as program data, and will retrieve the value of a specified data item for these parcel numbers (from the General Data File). The program will then print a list of the parcel numbers and the value of the specified variable for each parcel number. The variable to be listed, the variable format, and the number of parcel numbers to be considered are entered into the body of the program. The parcel numbers to be considered are entered as data and follow the main body of the program. This program can be combined with Program 17 in order to retrieve data on an address basis, or with Program 18 to retrieve data on a zonal basis. The tape to be used must be noted on the program control cards.

PROGRAM 16

RETRIEVE X FOR SPECIFIC PARCEL NUMBERS FROM THE GENERAL DATA FILE

```
3484,MAXMAN,CM70000.
REQUEST(TAPE1,HI,E). MOUNT CSC TAPE 774. RING(OUT).
RUN(S).
LGO.
'
       PROGRAM MAIN(INPUT,OUTPUT,
      1        TAPE5=INPUT,TAPE6=OUTPUT,TAPE1)
       INTEGER PNO,CRDTYP,CHANGE,TRANCD,DATA,OPNO,OLUSE,NULUSE,OWNER,
      1YRSUB,EASEMT,LNDMK,NEIGH,NOSTRUT,OLZON,NUZON,ZONREO,ZONVAR,
      2COMUSE,FLAG,WATER,SEWER,ELECT,GASS,WELL,SEPTIC,EMPARK,CUPARK,
      3RESPK,COMPK,SALEDT,GLARE,HEAT,VIBR,SMELL,GAS,RADIAT,NOISE,ELINT,
      4SMOKE,OLBLDG,NUBLDG,YPBLT,FND,FRAME,SIDING,ROOF,STRTYP,BLDCON,
      5OLSUSE,NUSUSE,TOTEMP,PEAKEM,OPTEMP,NOROOM,M0T5,M6T18,M19T25,
      6YRPRMT,NOFLR,BASMNT,NODU,VIOL,NOVIOL,NOEST,BLDKEY,OLOC,NULOC,
      7M26T64,MGT64,F0T5,F6T18,F19T25,F26T62,FGT62,F14T44,VEHOWN,POLCAL,
      8FIRECAL,WELFAR,NODIS,DISEAS,INTER, FUNCLS,STRCOM,GRADE,ACCID,
      9TRCONT,SPDLMT,NEPKG,SWPKG,CRBTYP,SIDWLK,NOLANE,LOAD,BUSRT,SCHRT,
      1ACCESS, OND,PRIZON,SECZON,TERZON,MNCOMP,SCCOMP,TDCOMP,MNLUSE,
      2SCLUSE,TDLUSE,LND,YRCH
       REAL FRONT,AREA,ASVAL,LDAREA,VALIMP,TOTVAL,SALEPR,COSTPR,TOTARE,
      1FSTAFF, ETBK ,REGBK,RECOST,INCOME,RENT,LENGTH,ROWID,PAVWID,ADT
       DIMENSION DATA(7)
C FORMAT FOR X IS PUT IN PARENTHESIS
  600 FORMAT(I6,I4)
C  MAXIMUM NUMBER OF ITEMS IN LIST IS PUT IN PARENTHESIS
       DIMENSION IPNO(100)
C  VARIABLE BEING LISTED
       EQUIVALENCE(X,NULUSE)
C  CARD THAT X IS ON
       I=1
C  NUMBER OF PARCELS IN LIST
       J=5
       REWIND 1
       DO 69 II=1,J
       READ(5,4)IPNO(II)
     4 FORMAT(I6)
    69 CONTINUE
     5 READ(1,6)PNO,CRDTYP,CHANGE,TRANCD,DATA
     6 FORMAT (I6,I2,I4,I2,6A10,A6)
       IF(EOF,1)699,161
   161 IF(CRDTYP.EQ.I) GO TO 100
       GO TO 5
   100 DO 169  K=1,J
       IF(IPNO(K).EQ.PNO) GO TO 150
   169 CONTINUE
       GO TO 5
   150 CONTINUE
       IF ( CRDTYP .EQ. 1) GO TO 3
       IF (CRDTYP .EQ. 2) GO TO 17
```

PROGRAM 16, CONTINUED

```
    IF ( CRDTYP .EQ. 3) GO TO 27
    IF (CRDTYP .EQ. 4) GO TO 37
    IF (CRDTYP .EQ. 12) GO TO 47
    IF (CRDTYP .EQ. 11) GO TO 57
  3 CONTINUE
  7 DECODE(66,8,DATA)OLPNO,OLUSE,NULUSE,OWNER,FRONT,AREA,YRSUB,ASVAL
   1,EASEMT,LNDMK,NEIGH,LND,NOSTRT,YRCH,OLZON,NUZON,ZONREQ,ZONVAR,
   2COMUSE,FLAG,WATER,SEWER,ELECT,GASS,WELL,SEPTIC
  8 FORMAT (I6,I4,I4,I3,F4.0,F6.0,I3,F5.0,4I1,4I2,I4,
   1I4,I2,7I1)
    GO TO 200
 17 DECODE(66,18,DATA)EMPARK,CUPARK,RESPK,COMPK,LDAREA,VALIMP,
   1TOTVAL,SALEDT,SALEPR,GLARE,HEAT,VIBR,SMELL,GAS,RADIAT,NOISE,
   2ELINT,SMOKE
 18 FORMAT (4I4,F3.0,2F5.0,I2,F5.0,9I1)
    GO TO 200
 27 DECODE(66,28,DATA)OLBLDG,NUBLDG,YRBLT,END,FRAME,SIDING,ROOF,
   1STRTYP,BLDCON,YRPRMT,COSTPR,NOFLR,TOTARE,BASMNT,FSTARE,NODU,
   2SETBK,REOBK,RECOST,VIOL,NOVIOL,NOEST
 28 FORMAT (2I2,I3,4I1,I2,I1,I2,F6.0,I2,F7.0,I1,F6.0,I3,3F3.0,I1,2I2)
    GO TO 200
 37 DECODE(66,38,DATA)BLDKEY,OLOC,NULOC,OLSUSE,NUSUSE,TOTEMP,
   1PEAKEM ,OPTEMP,NOROOM,MOT5,M6T18,M19T25,M26T64,MGT64,FOT5,F6T18,
   2F19T25,F26T62,FGT62,F14T44,INCOME,VEHOWN,POLCAL,FIRECAL,WELFAR,
   3NODIS,DISFAS,RENT
 38 FORMAT (3I2,5I4,12I2,F3.0,3I2,2I1,I2,F3.0)
    GO TO 200
 47 DECODE(66,48,DATA)INTER,LENGTH,ROWID,PAVWID,FUNCLS,STRCOM,GRADE,
   1ADT,ACCID,TRCONT,SPDLMT,NEPKG,SWPKG,CRBTYP,SIDWLK,NOLANE,LOAD,
   2BUSRT,SCHRT,ACCESS,COND
 48 FORMAT (I1,F4.0,2F3.0,3I1,F5.0,I2,I4,I2,10I1)
    GO TO 200
 57 DECODE(66,58,DATA)PRIZON,SECZON,TERZON,MNCOMP,SCCOMP,TDCOMP,
   1MNLUSE,SCLUSE,TDLUSE
 58 FORMAT(6I2,3I4)
    GO TO 200
200 WRITE(6,600)PNO,X
    GO TO 5
699 REWIND 1
    END

  11
  15
  16
  25
  45
```

Program 17: Retrieve Parcel Numbers for Particular Addresses

This program retrieves the parcel number for given street addresses or street blocks. The addresses are read as data and then the Parcel Number-Grid Coordinate-Address File is searched for the parcel numbers that correspond to the given addresses. The number of addresses to be entered must be noted in the body of the program. The actual addresses to be considered are entered as data and follow the main body of the program. This program can be combined with Program 16 to retrieve General Data on an address basis. This program will yield cards with the parcel number punched on them. These cards can be entered directly as data for Program 16 and thereby yield the General Data on an address basis. The tape to be used must be noted on the program control cards.

PROGRAM 17

RETRIEVE PARCEL NUMBER FOR GIVEN ADDRESSES FROM PARCEL NUMBER - GRID COORDINATE - ADDRESS FILE

```
3484,MAXMAN.
REQUEST(TAPE3,HI,E). MOUNT CSC TAPE 776. RING(OUT).
RUN(S).
LGO.
'
      PROGRAM COOR(INPUT,OUTPUT,PUNCH,
     1      TAPE5=INPUT,TAPE6=OUTPUT,TAPE7=PUNCH,TAPE3)
      INTEGER PNO,XCOORD,YCOORD
      INTEGER NUMBER
      DIMENSION ADDRES(9)
      DIMENSION TEST(9)
      K=0
C   ENTER THE NUMBER OF ADDRESSES BEING TESTED
      NUMBER=5
    1 CONTINUE
      K=K+1
      IF(K.GT.NUMBER) GO TO 988
      READ(5,50) TEST
   50 FORMAT (8A6,A3)
    5 READ(3,6)PNO,XCOORD,YCOORD,ADDRES
    6 FORMAT (I6,1X,I6,1X,I6,1X,8A6,A3)
      IF(EOF,3)666,65
   65 IF(ADDRES(1).EQ.TEST(1)) GO TO 100
      GO TO 5
  100 IF(ADDRES(2).EQ.TEST(2)) GO TO 101
      GO TO 5
  101 IF(ADDRES(3).EQ.TEST(3)) GO TO 102
      GO TO 5
  102 IF(ADDRES(4).EQ.TEST(4)) GO TO 103
      GO TO 5
  103 IF(ADDRES(5).EQ.TEST(5)) GO TO 104
      GO TO 5
  104 IF(ADDRES(6).EQ.TEST(6)) GO TO 105
      GO TO 5
  105 IF(ADDRES(7).EQ.TEST(7)) GO TO 106
      GO TO 5
  106 IF(ADDRES(8).EQ.TEST(8)) GO TO 107
      GO TO 5
  107 IF(ADDRES(9).EQ.TEST(9)) GO TO 4
      GO TO 5
    4 WRITE(6,7) PNO,XCOORD,YCOORD,ADDRES
    7 FORMAT(5X,I6,1X,I6,1X,I6,1X,8A6,A3)
      WRITE(7,6) PNO,XCOORD,YCOORD,ADDRES
      REWIND 3
      GO TO 1
  666 WRITE(6,70) TEST
   70 FORMAT(37H PARCEL CANNOT BE FOUND WITH ADDRESS ,8A6,A3)
      REWIND 3
```

PROGRAM 17, CONTINUED

```
      GO TO 1
  988 CONTINUE
      REWIND 3
      END

   111 SOUTH MAIN                                        ST
   555 WEST HIGH                                         ST
210003 NORTH MAIN                                        ST
   222 NORTH MAIN                                        ST
   999 THAMES                                            LN
```

Program 18: Retrieve Parcel Numbers for Specified Zones

This program will print a list of the zones and the parcels within each zone. The Zone Name-Grid Coordinate File and the Parcel Number-Grid Coordinate-Address File are utilized. Cards are also punched by this program which can be fed directly to Program 16 and thereby retrieve General Data on a zonal basis. The tapes to be utilized are noted on the control cards for the program.

Note: The Point In Polygon procedure used in this program is an adaptation of the work done by Mr. Robert B. Dial at the University of Washington.

PROGRAM 18

RETRIEVE PARCEL NUMBERS FOR A GIVEN ZONE
FROM THE ZONE NAME - GRID COORDINATE FILE
AND THE PARCEL NUMBER - GRID COORDINATE - ADDRESS FILE
(POINT IN POLYGON)

```
3484,MAXMAN.
REQUEST (TAPE3,HI,E). MOUNT CSC TAPE 774.  RING(OUT).
REQUEST(TAPE2,HI,E). MOUNT CSC TAPE 775. RING(OUT).
RUN(S).
LGO.

      PROGRAM MAIN(INPUT,OUTPUT,PUNCH
     1       TAPE5=INPUT,TAPE6=OUTPUT,TAPE7=PUNCH,TAPE2,TAPE3)
      DIMENSION ZON(4)
      INTEGER PNO,XCOORD,YCOORD,X(4),Y(4)
    1 READ(2,3)ZON,X(1),Y(1),X(2),Y(2),X(3),Y(3),X(4),Y(4)
    3 FORMAT (2A6,A2,A6,1X,I6,1X,I6,2X,I6,1X,I6,2X,I6,1X,I6,2X,I6,1X,I6)
      IF(EOF,2)400,11
   11 READ(3,4)PNO,XCOORD,YCOORD
    4 FORMAT(I6,1X,I6,1X,I6)
      IF(EOF,3)300,100
  100 COUNT=0.0
      U1=0
      V1=0
      U2=XCOORD
      V2=YCOORD
      DO 14 I=1,3
      XX1=X(I)
      YY1=Y(I)
      XX2=X(I+1)
      YY2=Y(I+1)
      ALPHA=XX2-XX1
      BETA=U1-U2
      GAMMA=YY2-YY1
      DELTA=V1-V2
      DETR=(ALPHA*DELTA)-(GAMMA*BETA)
      IF(DETR.EQ.0) GO TO 199
      A11=(DELTA/DETR)
      A12=(-BETA/DETR)
      A21=(-GAMMA/DETR)
      A22=(ALPHA/DETR)
      T1=U1-XX1
      T2=V1-YY1
      TO=(A11*T1)+(A12*T2)
      PO=(A21*T1)+(A22*T2)
      IF(TO.GT.0.0.AND.PO.GT.0.0) GO TO 60
      GO TO 14
   60 IF(1.0-TO.GT.0.0) GO TO 111
      GO TO 14
  111 IF(1.0-PO.GT.0.0) GO TO 12
      GO TO 14
```

PROGRAM 18, CONTINUED

```
 12 COUNT=COUNT+I.0
 14 CONTINUE
    ICOUNT=COUNT
    IF((COUNT/2.0)-(ICOUNT/2).GT.0.0)GO TO 99
    GO TO 11
 99 CONTINUE
    WRITE (6,110)PNO,ZON
110 FORMAT(15H PARCEL NUMBER ,I6,7H IS IN ,2A6,A2,A6)
    WRITE(7,201)PNO,ZON
201 FORMAT(I6,10X,2A6,A2,A6)
    GO TO 11
300 REWIND 3
    GO TO 1
400 REWIND 3
    REWIND 2
    GO TO 600
199 WRITE(6,200)PNO,ZON
200 FORMAT(27H CHECK COORD FOR PARCEL NO ,I6,10H  AND ZON ,2A6,A2,A6,
   *38H THE COMPUTATIONS CANNOT BE COMPLETED )
    GO TO 11
600 CONTINUE
    END
```